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CAROLUS LINNAEUS

A psychological study*

by

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Like many other famous scientists Linné is almost exclusively known by his works. The study of the latter, in fact, has always absorbed so much of the interest that the question what kind of man he may have been, receded into the background. The way in which his personality was judged, moreover, was strongly influenced by the authors' appreciation of his scientific merits, and this underwent in the course of time considerable changes. Another circumstance which makes it difficult to obtain a good idea of his personality lies in the fact that most of the sources of our information are Swedish, and as Linné occupies a similar prominent position in the Swedish national consciousness as Goethe in that of Germany, which means that he has become a kind of myth, it will be clear that the accounts of his personality contained in these reports are nearly always more or less idealized and often distorted.

When a man's personality can be studied during his life time, the results certainly are not always satisfactory, but when such a study has to be carried out a considerable time after his death, when e.g. several tests can no longer be applied, the chance that fully reliable results will be obtained, becomes even smaller. Nevertheless, as the real significance of a man's achievements can, in my opinion, only be understood if we have some insight in his instincts and his inhibitions, his weaknesses and his strength, it seemed desirable to undertake such a study. The attempt, moreover, did not look quite unpromising. Linné has left much autobiographical material, and we possess, moreover, a large part of his very extensive correspondence, and in the latter also much of his inner life is revealed. In addition we have several reports written by his contemporaries.

As an introduction to my analysis of Linné's mental character I will give a few notes on his physical properties.

Linné was rather short, but his build was more of the athletic than of the pycnic kind; his eyes were dark; as a boy he was light-haired, afterwards he became dark. In early youth his health was on the whole satisfactory, but he had bad teeth, and suffered from them. He also had frequent attacks of head-ache (perhaps megrim), and from 1750 onwards he suffered from podagra; since then he often felt tired, and he had all sorts of complaints belonging to the rheumatic syndrome. He was also visited by the "stone", that faithful associate of rheuma, and a few years before his death he had a stroke, whereas already at an earlier date indications of an increasing dementia, probably of arteriosclerotic origin, were present. All these diseases may be ascribed to a definite physical constitution, but he was visited also by a number of more accidental diseases, e.g. during his stay in Holland and afterwards in Uppsala by "remittent fever", further by a pleuritis, an anguina, etc. Occasionally he suffered also from mental overstrain, e.g. in the autumn of 1734 and in 1748.

In my attempt to discover the nature of the mind that resided in this body, I have

* This is a slightly abbreviated version of Chapter VI of my doctor thesis "Carolus Linnaeus als middelaar tussen Zweden en Nederland", Utrecht 1953 (Dutch).

followed the instructions recommended to this end by Prof. H. C. Rümke in his work on contemporary psychology.

To beginn with I will try to determine Linné's character in the period of his maturity. To this end I will successively consider it in the three different aspects that are recognized by Klages. As far as possible, I will base my conclusions on accounts given by other people and on "unconscious" remarks of Linné himself, for the autobiographical material is for this purpose too strongly coloured, viz. by the retrospective meditations on the meaning of his life that occupied his mind in his later years. [1])

Description of Linné's character by means of the scheme developed by Klages

I. The "material aspect" of Linné's character

What Klages calls the "material aspect" of the character is the same thing as the "natural endowment" of the pedagogues, i.e. the sensitivity to definite impressions and the faculty to assimilate the latter.

A. The sensitivity to definite impressions

The nature of the perceptive faculty can only be judged by means of the reactions that are provoked by the impressions. Linné's reactions are recorded in his note-books. Throughout his journeys he used to write them down in a diary; during some of them he even kept more than one. In these diaries his reactions were recorded before they had got time to change. These books of travel are fascinating reading, and it is not to be wondered that they have become, either in their original wording or else in a slightly more elaborate form, classical examples of descriptive art in Swedish literature. They are also praised as the first attempt to render one's impressions in a natural and simple, but for that all the more expressive form.

The characteristic features of Linné's mode of exposition appear to be

1° its extraordinary strong sensual character, i.e. the "warmth" of the description; see, for instance, that of his first meeting with Clifford in his "Iter ad Exteros". When he approaches a town he depicts to us its silhouette and notes the aspect of the surrounding hills, a river, the tint of the coniferous or deciduous woods, the weather, a bird that just bursts out in song, the flowers along the roadside, the clothes of the peasants. All these things are recorded in short sentences, sometimes in almost telegraphic wording and with numerous abbreviations; if the smells had not been mentioned too, we might almost believe that the voyage was projected for us on a screen.

2° its "richness". Linné possesses an extraordinarily well-supplied fund of recollections; he always has a striking comparison at hand, quotes classical authors, inserts a medical note. This is perhaps the principal base of his very pronounced sense of humour, which finds expression in unexpected comparisons and in similar effects.

3° its "moving-picture" character, which indicates an easy mobility of the images that were formed in his mind. He records, eventually adds a short comment, and turns to the next object.

4° its "directness". He describes a new object exactly as it is and without bias, i.e. he is not influenced by preconceived notions nor by the public opinion. [1]) This freedom of bias was also present in Vesalius, but it was almost entirely wanting in the majority of the scientists of that time, who were usually inclined to belief on authority. Linné put more faith in the value of observations than in the verdicts of traditional science and in conclusions based on generalisations; even for the fallibility of his own classifications he had an open eye.

B. The assimilation of the impressions

Impressions can be assimilated in different ways and to a different degree. This depends on the apperceptive activity of the mind. In Linné's case we come to the conclusion

1° that he possessed this assimilative faculty, this capacity to increase his spiritual property, to a high degree. Up to the last he was always glad to receive new plants and animals, and it remained a pleasure to find them their place in his classifications. However, for new theories too he kept an open mind, and he always tried to coordinate them with

his own views, and not only with those of a purely scientific character, but also with those of a religious or ethic one. In his doctor's thesis he already combined a large number of data derived from the literature with his own observations to a well-balanced whole, but it is in his "Clavis Medicinae" that this assimilative faculty is perhaps displayed to the best advantage.

2° that he strongly relied on his own impressions, and tested the value of what he heard from others by the aid of the latter. It was this faculty which enabled him to form himself an opinion of the real value of conventional conceptions; he was but rarely laid astray by dogmatic prejudices and traditional convictions. This explains why e.g. his "Materia medica" makes a more modern impression than other works that were written on this subject during the same period. There was but one exception; when his observations led him to conclusions that were irreconcilable with the orthodox interpretation of the Bible, he bowed his head. A typical example is his hesitating admission of the biblical age of the earth. On account of the geological facts, he writes, "I should like to regard her as even older than she is believed to be by the Chinese, but the Scriptures do not allow this".

3° that this judgment was extremely subjective. This is brought out in the letters in which he speaks of his pupils. His opinion is always based on the regularity with which they attend his lectures and on the value of the collections of animals and plants which they send to him. In one of his earlier letters he expresses himself rather deprecatingly on ROSEN's medical knowledge, in a later one with the highest praise, but at the time he wrote his first letter, ROSEN was his antagonist, at that of the second one he had become his friend and medical adviser. In fact, I have not been able to find in his correspondence a single unbiassed judgment on any person with whom he was acquainted.

4° that the prevalence of his subjective judgment over the objective one is seen even in his descriptions of natural objects. When he describes a bird, he expresses his admiration for its beauty, in describing an amphibian he shows his dislike, in describing either very large or very small animals his wonder, etc. In political questions his judgment rests on his friendship or admiration for definite people; during his sojourn in Stockholm he joined the party of the "hats" because he knew and admired their leader, and at the time of the coup d'état by Gustave III he turned to the latter because he saw in him the saviour of the country from the party quarrels; in the latter he had never taken any part.

5° that he attached great importance to concrete facts. Whenever he arrived at a generalisation, he adduced a large number of examples in support. His unfinished "Nemesis divina" in fact is no more than an imposing collection of anecdotes and by no means a treatise on abstract ethics. When he arrived on account of a series of good observations to a general rule, the formulation of the latter was often unsatisfactory, and there is no trace of the mastery which he displayed in the classification of his results. In this field he was, moreover, handicapped by the conviction that he ought to remain within the limits set by the religious dogmas.

There are two more points that deserve our attention, viz. his power of recollecting and the predominant part that visual impressions played in the world of his imagination.

With regard to his recollection it is worth noting that the impressions which he received in his youth retained their force; this applies to his emotional experiences as well as to what he learned at school. His faculty to recollect concrete facts must have been well developed and here too the visual impressions will have come first, the sensual and emotional ones in the second place. LINNÉ's memory for visual impressions seems to me the base on which his talent developed, for it was this faculty that enabled him to master the vast diversity of the three reigns of nature.

A quantitative estimation or better approximation of one's talents is in the absence of tests extremely difficult. In LINNÉ's case we have to rely on the opinion of his teachers and on the nature of his achievements, but the opinion of other people contains, of course, a subjective element and is always more or less biassed, and the nature of one's achievements does not depend on natural endowment alone, but also on environmental factors and on various impulses.

It is known that LINNÉ doubled the upper two classes of the lower school and the top one of the gymnasium, so that he was already twenty when he arrived at the university.

We know that he had no difficulty in remembering long Latin plant names, that he collected plants and could recognize a large number of them by sight, and that he excelled in the course given by ROTHMAN on natural science, "logices et physices", but that he was bad in all other subjects, classical languages, rhetoric, etc. What does this mean?

We must realize that the "other subjects" rest in the main on knowledge of the grammar, and the latter must have been LINNÉ's weak point. Words, e.g. plant names, he could quite well remember, and the same applies apparently to quotations, of which a comparatively large number are found in his works; in these cases the association with definite objects may have played a part. A special aptitude for grammar, especially for the Latin one, is a quite different thing; it often goes together with a gift for mathematics, probably because it rests like the latter on a certain aptitude for abstract thinking, and this, as we have seen, was but poorly developed in LINNÉ. It is therefore noteworthy that he was a poor arithmetician; during his voyage to Lapland he made mistakes in the calculation of the distances, and during his stay in Holland his bookkeeping was far from perfect.

LINNÉ admitted that he had no ear for music, and in his quotations from poets he often made mistakes by which the rhythm of the verse was destroyed. He also used to excuse himself "that he was no orator", a shortcoming that may have been responsible for part of his bad school record.

In connection with his lack of interest in languages the following two contradictory facts deserve our attention. During the three years which he spent in Holland he was unable te learn the Dutch language, and the few Dutch words that occur in his diaries, e.g. the names of the North-sea Islands, are badly misspelled. However, in the diary of his voyage to Lapland he gives a list of Finnish words which according to a modern specialist are phonetically well rendered. This contradiction may find its explanation in the circumstance that the Finnish words really interested him, whereas the Dutch geographical names have probably been quoted for the sake of completeness only; the discrepancy may therefore be due to a difference in concentration. LINNÉ was especially in his younger years inclined to concentrate his attention on the things that interested him and to neglect the rest. A striking example is the division of labour on which he agreed with ARTEDI. LINNÉ writes "ARTEDI was so much further in chemistry that LINNÉ left this entirely to him". In this field he himself seems to have stuck to the four Aristotelean elements with which he became acquainted during his school days. Was it perhaps this faculty to restrict himself to definite subjects that enabled him to obtain his mastery?

Another point that deserves our attention is his pronounced artistic temperament [2]), a feature that is often overlooked by those to whom he is but a "dry systematist". This artistic temperament expressed itself actively as well as passively. He showed himself an amateur draughtsman with an excellent feeling for form, as is shown e.g. in his "Lachesis Lapponica" by the picture of the owl, and he illustrated many of his letters with drawings. From those who intended to become scientific explorers he demanded that they were able to draw. The furnishing of his country-seat Hammarby with the fine flower-pieces of EHRET and PLUMIER testifies for his refined taste and proves his feeling for colour combinations. Archbishop BERZELIUS declared in 1755 in a church meeting at Upsala where the value of an old picture in the cathedral was discussed "Archiater LINNÉ is in this town the best authority on paintings". It can therefore not be doubted that LINNÉ was an aesthete. This appears also in several of his descriptions of animals and plants. In later years, however, he tried to subdue his enthusiasm for the beauty of nature and to conform his descriptions to the ethic norms by which, as his gradually developing religious feeling taught him, this grand but cruel world is governed.

LINNÉ admitted, as we have heard, that he had no ear for music, and it is therefore no wonder that nowhere in his works any attention is paid to the song of the birds, his favourite group of animals. His "Journey to Lapland" begins with a fine picture of the spring day on which he set out. One of the features of the scene is a singing skylark, and this induces him to quote OVID's "Ecce sum tirili, tirili, sum tirili tractat", but he makes no attempt to characterize this song. How amusingly simple his musical notions were, is well illustrated by the glass bells that were hung up between the trees in the park of Hammarby.

His classification of the medecines according to their taste and smell gives us some indication with regard to his sensitivity for this kind of impressions. With regard to taste

as well as to smell he distinguishes ten different degrees, but this is not so important as it might seem at first sight, for the recognition of the ten degrees appears to rest on a preconceived notion. Another and perhaps more significant indication is found in the circumstance that he enjoyed, although with moderation, good eating and drinking. However, visual delights seem to have been the only ones in which he really revelled.

II. The "structure" of his character

The structure of the character is the expression used by KLAGES for the reactivity, i.e. for the willingness and ability to react on stimuli.

1° The "temperament" of the individual is determined by the relation between his willingness to react and the "inhibition". Judged by this measure LINNÉ may doubtless be called temperamental. The strength of his impulses is well shown in the energy with which he threw himself on his gigantic task, the reconstruction of the biological classification, and with which he stuck to it under adverse circumstances. It appeared also in other ways. As soon as he came into contact with a new development, he was at once full of plans, compare e.g. his proposals for the improvement of the country's economic condition, and he at once set to work. His inhibitions, on the other hand, will have been of normal strength. In 1734 he harboured, according to his own admission, very agressive plans against ROSEN, by whom he felt himself wilfully opposed. He sought a solution in the sense of "perishing and by his own downfall destroying his enemy". The plans, however, were not carried out, for a dream, i.e. an unconscious inhibition, held him back. When he grew older, he learnt to restrain himself, and his temperament showed itself in trivialities only; e.g. annoyance over the refusal of his wife to provide beer to students who visited him at Hammarby, once caused a slip of the tongue in the presence of his guests.

2° His humour was on the whole expansive. He did not put his light under a bushel. He always wanted to teach and to speak of his discoveries with others, and could not bear loneliness, e.g. when he stayed in the house of CLIFFORD. His pupils and friends describe him as fond of company and of talk, and as a man who spoke without restraint and was inclined to take things lightly. However, after 1748 periods of depression occurred more and more frequently, and he became inclined to see everything from the darkest side. This complete reversal in mood too may perhaps be regarded as an indication of a high degree of reactivity. In his periods of depression he will probably have worked on his "Nemesis divina", and at such moments he will have written his somber letters to BÄCK. Further on I will come back to the cause of this change.

3° Nothing is perhaps more difficult to the psychologist than to judge the feelings of a person with whom he has no direct contact. The sensitivity that is outwardly shown, is directly proportional to the vivacity of one's feelings, and inversely proportional to the depth of the latter. It looks plausible that a man who is accustomed to express himself with great vivacity, will do this also, and even to a higher degree, when he gives expression to his feelings. If we wish to form ourselves an opinion on the degree of this vivacity, we should realize, however, that in the early days of the romantic period it was much more "bon ton" to show one's feelings than it is now. LINNÉ was, according to his diaries, truly impressed by the misery and poverty with which he was confronted. He "could not see it" when his wife gave his daughters a thrashing, and occasionally he aided impecunious students. However, it seems to me that there is reason to doubt the depth of his feelings. On the death of ARTEDI, his best friend, he muses in the following way "The prince of the fishes died in the element of the fishes", which seems rather bad taste. In his record of the last visit he paid to BOERHAVE the high esteem in which he was held by the latter is duly mentioned, but hardly anything is said with regard to BOERHAVE himself. When one of his daughters leaves the drunken brute to whom she is married and returns home, her unhappiness apparently does not move him; at the same time, however, he shows a great fondness for his little granddaughter. It is possible, of course, that previous "psychotraumata" may have exercised a distorting influence. At any rate, it seems impossible to see in LINNÉ a man of deep feeling.

4° The will, which finds its expression in deliberate action, is the composite effect of the wish to act and its inhibition. That LINNÉ's will was already in his school days strong enough to overcome considerable resistances, is proved by the fact that he chose against

the wishes of his parents a medical career instead of a theological one; and in the way in which he brought this study to a good end, notwithstanding the many financial and other difficulties with which he had to contend, he showed that his will was also strong enough to achieve success. The rapidity with which he carried out his plans, proves in my opinion that he was not strongly inhibited.

5° Finally we have to consider the way in which he expressed his opinions. The latter is the resultant of an excitement to speak and an inhibition. The excitement will in LINNÉ's case nearly always have been present, for he was, as we have seen, very sensitive to impressions and at the same time expansive. The inhibition, i.e. the reluctance to express oneself, which KLAGES regards as a means of self-protection, can in my opinion not be taken as a homogeneous factor. LINNÉ expressed his opinion on matters of scientific importance with the greatest frankness and without regard for the views of other people, even if the latter were men of greater renown or of more influential position. In his later years his attitude with regard to members of the Royal family too was one of a great independence. After 1734, the date of his conflict with ROSEN, an inhibition of a quite different kind, viz. a religious one, made itself felt, and he vented his criticism of others no longer with the same freedom. He also became more cautious in the exposition of new theories, which had to pass the ever more powerful inner religious "censor". His lectures, however, do not seem to have lost the attraction of his vivacity. All we have said sofar applies to the way in which he expressed himself either by word of mouth or in writing, but the mind expresses itself also in the movement of the facial muscles and in the handwriting. With regard to the expression of LINNÉ's face we are, however, insufficiently informed, notwithstanding the fact that there exist a comparatively large number of portraits of him. An analysis of his handwriting looks at first sight more promising, but unfortunately the antiquated lettertype and the loss of clearness in the photographic reproductions appeared to offer insurmountable difficulties, so that this line of study too did not lead to new points of view.

III. The "quality" of his character

The two main contending tendencies of the human character are, according to KLAGES, the "spirit" that tends to preserve the ego, and the "soul" that is inclined to surrender it.

In LINNÉ the spirit of self-preservation was throughout his life the dominating tendency, and this is what we should have expected on account of the conclusions to which we came with regard to the "structure" of his character. In his spiritual life it was, however, not very pronounced, and here it was occasionally overcome by the tendency to submission. The latter found its expression in his ardent wish to learn, his aesthetic craving and his ethical pathos. In the motives of his material actions the tendency to assert himself was much more pronounced, and here in fact all forms of egotism manifest themselves; active egotism, which finds its expression in a craving to expand the personality, i.e. in ambition, in the need of recognition, and in the wish to excel; passive egotism with its cautiousness and calculation in the contacts with others; reactive egotism, which is responsible for the wish to retaliate. The dominance of these egotistic feelings was, however, not once of all fixed; when he grew older, he tried to subdue them, and especially his desire to retaliate was conquered by his ardent longing for spiritual submission. It appears from his "Nemesis divina" that he became convinced that God alone has the right of retaliation, and, in fact, that He never failed to exercise it. In the field of the sensual needs he was, as he himself declared, very moderate; this applies to this sexual desire as well as to his fondness for eating, drinking and clothes. All these things together seem to prove that LINNÉ's main characteristic was activity (will and brains); that his mood vacillated between the craving for power and success and the admittence of impotence and failure; his self-affirmation between self-confidence and self-distrust.

The conclusions reached so far seem to be quite plausible, but there are nevertheless several difficulties, partly on account of the uncertainty of our method of investigation. Although the application of the latter on a "high level", i.e. with regard to the so-called spiritual motives, offers no difficulties, there is doubtless a certain arbitrariness in its application to motives of other kinds; for in their case the situation differs in the various periods of one's life; the distinctions become less clear, and the same action may be

interpreted in different ways. The spiritual motives remain more or less the same throughout life; one gets the impression that they are more or less ready-made receptacles serving to collect the energy that elsewhere is set free. The material and sensual motives, on the other hand, would represent the forces of the subconscious in the form in which they enter our consciousness. They are therefore of a dual nature and can be dissolved into a driving force springing from the "Es" and into a counteracting force from the "Super-ego". When this is taken into consideration, it becomes clear why these motives are much less constant in direction, in strength and in proportion to each other than the spiritual ones. The instincts are forces that are dependent on the vigour of our general vitality, which undergoes considerable changes in the course of life, especially when one physiologic phase passes into another one. The spiritual "sublimation" which LINNÉ underwent in his later years becomes in this way easily comprehensible. In the following chapter I will try to analyse these changes by means of the more dynamic schemes of FREUD and ADLER.

The development of Linné's character

"Es bildet ein Talent sich in der Stille
Sich ein Character in dem Strom der Welt."

This pronouncement of GOETHE finds support in the "histoire intime" of LINNÉ's life.

According to the psycho-analytical school the most important impressions from the outside world are received and assimilated in one's youth, in the contact with parents, brothers and sisters, and it are these impressions that leave a permanent mark on the mind and that determine its attitude towards the outside world. With regard to LINNÉ's youth we find a few objective data in a letter written after his death by his brother, the Rev. SAMUEL LINNÉ, to HALLENBERG, who was collecting materials for a biography. We learn from this letter

1° that when CARL was to be born, his mother hoped for a daughter, so that his birth was a serious disappointment to her; her husband, however, was all the more happy, and succeeded in consoling her.

2° that CARL was "daddy's boy"; very soon the father took him along when he went to work in the garden, where he was allowed to help and where he obtained a plot of his own. Afterwards he must learn to read, and that went well enough but he preferred to work in the garden. "His mother scolded him, but the father took his only son in protection".

3° that CARL already at a very early age conceived the plan to study medecine. He had taken LANNAERUS and ROTHMAN into his confidence, but for a long time he did not dare to tell his parents. Finally he said it to his father, and the latter told his mother, "who nearly had a fit" when she heard it. Her only consolation was that she had another son, and she decided that this son should be kept away from the garden. Nevertheless, every time that CARL went to Växiö the preparation of his knapsack was a sore task to her. Finally, however, when she saw that SAMUEL would fulfil her wishes, her chagrin on account of CARL's defection was relieved.

4° that CARL during the years he spent at the Växiö gymnasium filled his holidays with reading and with collecting plants, rocks and insects. His mother consoled herself with the knowledge that he did something useful and kept out of mischief, and his father strengthened her in this belief. "Partly because of his lack of self-control, and partly in order to give him time for study, he was relieved from the task to teach SAMUEL". The life in the vicarage of Stenbrohult seems to have been bright. Their play was characteristic for CARL's turn of mind, for "Carl carried out sham medical operations on his brother and sisters".

5° that CARL shortly after he had finished his first year at the University of Uppsala became "vicaris-professor", and that "from that moment the frigid attitude of his mother changed; she saw her son so young already vicaris-professor; so far she had thought that he would never be more than a practising physician, and now she heard that he acted as professor, and that only two years after he had begun his studies; that was almost unbelievable".

6° that CARL when he "visited his beloved parents at Christmas 1732", was received with great joy, and that this was the last time he saw his mother.

From these data the following conclusions can be drawn. For three years CARL LINNÉ

was an only child. Then, in 1710, he was "dethroned" by a baby sister, whose birth fulfilled the mother's heart desire. We also know that the birth of his second sister caused his "bannishment to Växiö". However, during all these years he remained the favourite of his father. In the years of his puberty he extorted from his parents the permission to study medicine instead of theology; because of this his mother transferred her love to her second son SAMUEL (born 1718). Only after years of strenuous effort and after he had obtained an honourable position CARL regained her affection; this was in 1732, when he was 25. Shortly afterwards his mother died, so that he enjoyed her "regained affection" but once. In LINNÉ's youth the situation therefore was so that there was a kind of repulsion from the side of his mother and of attraction from that of his father. It is to be expected that this will have exercised to a certain degree a psychotraumatic influence on the boy. LINNÉ has, it seems, never been able to coördinate these impressions to a harmonious whole. Every time that he began a new biography he tried to turn this painful recollection from his youth, viz. the feeling that he was regarded as "the lost son", into a kind of myth. However, in each subsequent period of his life he related this episode from his youth in a different way, and it are in fact these different interpretations that reveal something of his "complexes". Unfortunately, the autobiographies have not reached us in their original form, for they were, as MALMESTRÖM [10]) has shown, more or less polished by admirers. At any rate, we may safely say that the situation in his youth was favourable to the development of the neurotic features that showed themselves in his later years. To this frustration of the normal feeling towards the mother was added the disappointment caused by the knowledge that most of his teachers at the primary school and at the gymnasium had a rather low opinion of his capacities. In his "craving for power" too he repeatedly suffered defeat. I have found no particulars with regard to his relations with the other boys, but we know that he was rather small, and this too may have favoured the development of a minority complex.

In the circumstances related above lies in my opinion the key to several of LINNÉ's actions and reactions, which do not seem to fit into the general frame of his character, and which strike us as unusual for the time in which he lived.

In the first place we will consider here his attitude towards the problem of matrimony. Whereas his behaviour during the whole period of his study at the university had been either calculating or at least coolly contemplating, he engaged himself in the winter of 1734 to 1735 suddenly to a girl whom he had met a few weeks earlier for the first time. This engagement too has been set on the account of his calculating nature, and in support of this opinion it was pointed out that shortly before a friend had advised him to marry a rich girl. HAGBERG, however, draws the attention to the fact that his letters reveal the normal ardency of a man in love. An indication with regard to the nature of his feelings towards his betrothed is to be found in the likeness of the latter with his mother, which is revealed by their portraits. Unconsciously he may have sought in her a substitute for his mother. In later years too it seems that he tried to reestablish the relation of son to mother. His wife is said to have been a resolute, severe, cool and rather matter-of-fact matron, to whom LINNÉ left most of his affairs; students who attended his course at Hammarby, sometimes had to pay their fees to her; she upbraided him when he did not keep the floor clean, etc. At any rate, although the time of the year and the prospect of leaving his country may have had something to do with his falling in love, its suddenness suggests the influence of an unconscious motive like the one mentioned above.

It is noteworthy that in his dealings with his children the attitude he assumed towards his son was totally different from that which he took up towards his daughters [12]). He did his best to protect the latter against the harshness of the mother, and spoiled them in every way; especially towards the youngest one he was very indulgent. From his son, however, he expected that he should follow in his footsteps, and as he hoped that he would succeed him in his functions, he gave him a special training.

Whereas the influence of the erotic complex on his behaviour has received but little attention, his ambition and the exaggerated opinion he held of his own importance have often been commented upon by his biographers. However, here too the situation is not so simple and the facts are sometimes contradictory. On the one hand LINNÉ appeared to be vain, somewhat too eager for distinctions, inclined to extol his own work and to belittle

that of others, and to give the cold shoulder to those who did not show sufficient appreciation or who dared to criticize him. In his later years, it is true he developed a religious humility which enabled him to restrain these feelings. He assumed, however, a totally different attitude in the incidents with Hårleman, A. v. Haller and others, people who opposed him with unfair means and who tried to humiliate him. Before them he threw himself in the dust, although he might very well have defended himself; he even might have ignored their attacks. It seems to me that the key to this contradictory behaviour too must be sought in the experiences of his youth. The circumstance that he had been a "failure" at the gymnasium and was considered unfit for the study of theology, will have given him a minority complex for which he had found at that time already a compensation in his excellence in the field of botany and in other branches of natural science. As a student he was handicapped by his poverty, but he will have consoled himself with the thought that "at any rate he knew more than the others". During all these years, however, he will have suffered from a lack of love and consideration, indifference from the side of his teachers and an increasing frostiness at home. In his later years I note that he repeatedly behaved in the same way; among strangers from whom he hoped to obtain some favour he showed an overcompensation of his minority complex, often in an objectionable way. As he had never had the opportunity to learn the art of dissimulation that is part of polite conversation, it is certainly no wonder that his manners were not always pleasing. It seems to me that there is no reason to ascribe this, as Malmeström [9]) does, to a spontaneous open-heartedness and an aversion from dissembling. In later years he was, as we learn from his own pen, by no means unable to hide his feelings. It is possible, however, that the effect of this dissimulation will often have been spoiled by his impulsivity. On the other hand, when he had to deal with people to whom he felt a friendly inclination, the fear that he might lose their affection proved to be stronger than the wish to assert himself, and then he was prepared to accept humiliations. We may say with Adler that Linné's "fictitious aim" was to obtain the admiration and love (warmth) of the people with whom he came into contact, and to prove to himself that he was "an instrument in the hands of God", i.e. that his life had a metaphysical meaning, that it was hallowed. In this attitude he tried to find a compensation for the painful experiences of his youth. Afterwards his craving for power found a substitute in a patriarchal attitude towards his pupils and an air of independence with regard to people of higher standing. This may have served as a compensation for the consciousness of his small stature. Moreover, as he now occupied an important position, he no longer felt himself menaced, and the need to assert himself was no longer strongly felt. Then, he also developed a sense of "being led", the conviction that the human being is in itself of no great importance, and his defiant need of self-assertion was in this way compensated by a feeling of religious humility [8]).

Although it can not be denied that the home life of the child is of primary importance for the direction in which his instincts will develop, the contact with other people in his environment also leaves its imprint on the child's character, and this is the more marked when the contact takes place early in his life and when it is intense. The position of Linné's father made him a central figure in the social life of his community, and this meant that Carl was continually in contact with the people of Stenbrohult. I have found no indications that he ever felt himself separated from them by class distinctions, and it is certain that he always remained interested in the mode of life and in the way of thinking of the common people. As an example I may refer to a remark in the report on his last voyage in Sweden "it would be desirable to register all superstitions that are still living among the people, and to study their origin". However, this is not all. E. Ehnmark [4]) has drawn the attention to the fact that Linné himself had assimilated part of these popular beliefs. In his ethic and well as in his religious views folkloristic elements occur side by side with traces of other influences, the orthodox Lutheran doctrine which he imbued at home, and the Stoic philosophy with which he became acquainted at the gymnasium.

In how far ethnic and geographic factors have played a part in the development of Linné's character, i.e. in how far he was a "typical Swede" or "Smålander" can only be decided by an investigator with sufficient experience in the field of national characteristics. The long winter of the northern countries, which is followed by a short period of intense growth, may perhaps be favourable to the development of a feeling for the beauty of nature

and for all that lives and grows. The latter may be responsible for the frequency with which in the literature of the Scandinavians natural scenery is depicted, and it certainly was strongly developed in LINNÉ.

To offer an opinion on the question in how far hereditary factors were involved in the development of his character, is an even more risky undertaking. We know that he resembled his father in the smallness of his stature and in the dark colour of his eyes; his mother was of the "Nordic" type, i.g. slender, light-haired and blue-eyed. According to HAGBERG both types are still met with among the people of Småland. Narcissism was one of his striking features and we know that this is in uniovular twins often developed to the same degree and that it may therefore be regarded as a hereditary character. Of LINNÉ's ancestors we know nothing in this respect, but it can hardly be doubted that he transmitted this tendency to his son, who is said to have been vain and egocentric. His own egotism therefore may not only be due to the factors that according to ADLER are responsible for the development of such character traits but also to hereditary ones.

The subsequent phases of Linné's life

A danger that the biographer of "generally recognized great men" should try to avoid, is the tendency to schematize their character. Most biographers depict their subject either as a Napoleon or as a Hercules. Already as a child he shows an extraordinary talent, he is misunderstood, then recognized, and finally he reaches an exceptional height by persevering in the pursuit of a definite ideal, or, and this is the alternative, he possesses great gifts, but they remain asleep until they are awakened by a shock, after which the direction of his destiny is fixed. Both interpretations return in the works of LINNÉ's biographers. To some of them he was called by nature to a great destiny, to others he was the naively sensitive amateur naturalist who gets a severe shock (the conflict with ROSEN) by which he is reborn as a true scientist. Both interpretations are doubtless too simplistic.

In the preceding chapter I have tried to determine the nature of the inner conflicts that LINNÉ like everybody else had to pass through, and I have tried to find out what influence the latter may have exercised on his character. It was found, moreover, that LINNÉ not only was subject to impulses that destroyed the uniformity and consistency of his behaviour, but also that he reacted in the various periods of his life in a different way. It seems worth while to consider these differences in the way in which he reacted in connection with the successive physiological periods of his life.

The periods of his youth and of his puberty have already been dealt with. From 1727 to 1734, i.e. in the second, more "spiritual" half of the puberty phase, he studied at the university. In this period he seems to have needed all his energy for the struggle with the academical demands and with his pecuniary stringency. It appears, however, that he nevertheless found time to develop his "social instincts" [11]), for we hear that he occupied a position in the corporation of the Småland students, and that he spent in the winter of 1733 to 1734 and also in that of 1734 to 1735 his Christmas holidays at the home of friends. He did not shrink from social contact either, and from notes in his diaries we learn that he could entertain the fair sex in an agreeable way. He certainly was at that time a young man who liked joyful company. When describing a feast to which he was invited at Falun, he even informs us that he had learned "to drink through drunkenness to sobriety". I notice in this period of increasing success indications of an overcompensation of his minority complex, e.g. in the way in which he cut up another student at a public disputation (23.6.1730) [5]). In going through the paper he had already adorned the name of the student with the epithet "pseudomed. stud.". However, this period of self-assertion did not last long, and he suffered a painful reverse. The return of ROSEN cost him his temporary position, and his pecuniar difficulties continued. The three most noteworthy events of that period are 1° his agressive intent with regard to ROSEN and his repentance afterwards, 2° his betrothal and 3° his setting out for Holland. He is at that time 28, i.e. on the threshold of maturity. He himself was well aware of the importance of the moment, for he reflects "at 28, it appears what one is". The incident with ROSEN marks the starting point of his reflexions on the "Nemesis divina", and the biography written at that time on his instigation by BROWALLIUS in the latter's "Libellum Amicorum" is the first of a long series of auto-

biographies. His strongly extrovert attitude is for a time replaced by one of introversion; he tries to find a meaning for his existence.

The next period is that of his productive maturity. It lasts from 1735 to 1750. The years of pupillage are past; when he sets out for Holland, a great part of the works that will bring him fame, are already written down. It is true that he received in Holland impressions that were very important for his further development, but what he learned there served on the whole more to increase his knowledge and to fill hiates than that it opened new vistas to him. The main object of his stay in Holland was to find a publisher for his works; he now reaped what he had sown. New theoretical views, e.g. philosophical systems like the materialism, do not appeal to him; he sticks to the ideas that he had absorbed in his youth. He confines his attention to what fits into his scheme; the revolutionary development of physics and chemistry is hardly noticed by him. Back in Sweden he confines himself almost entirely to the application of his knowledge; he is keen to propagate it among his students, but he is more or less deaf to the voice of other scientists. During the first year of his professorate he seems satisfied with himself and with the world, and he shows a pronounced extroversion. About 1748 there is, however, a sudden change in his attitude. He is at that time 41, an age at which one has the greater part of his life behind him, and at which it becomes difficult to find a new footing. The direct cause is a conflict with baron Hårleman, who criticized his botanical excursions. Linné considered this part of his teaching a great success, but some of his colleagues were of opinion that they disturbed the orderly sphere of the University. He feels himself misjudged and thwarted. But there is more. The public opinion undergoes a change. The program of the party of the "hats" had been too optimistic; the development of the country's own resources had produced far less than was expected, and the interest in the natural sciences, of which so much had been hoped, begins to wane. The institution of state examinations and the promotion of the civil servants according to age has a bad influence on the ambition of the students. Linné becomes sceptical, and this scepticism also awakes in him a doubt in the value of his own work and in his own importance. Physically too he feels a decline; he suffers from rheumatism and fevers. He now develops a tendency to introversion, and this time his new orientation finds expression in a vindication of the divine providence, a theodicy. In the preceding years he had written on the Creation in a lyrical vein; his work had sometimes sounded like a panegyric. Now however it becomes a defense of the Creator's intentions, a grandiose attempt to prove God's justice from his works, i.e. from man and his institutions and from nature. In this way he tries to regain his peace of mind. When one reflects on the trifling value of man's position in the universe and with regard to a just and exalted God, the sense of one's own inferiority becomes easier to bear.

A fact that may throw some light on this spiritual development and on the tendency to introversion that he displayed at this time, is mentioned by one of his pupils. The latter reports that Linné when he had reached his fifth decade, liked to work at night. At that time he went to bed early in the evening, rose when his wife slept, and worked until morning with a cricket as his only company. After that he went once more to bed and slept as long as he thought convenient. He was at that time mild and friendly towards strangers, but he showed himself often painfully affected by the roughness of his eleven year younger wife.

Throughout his life Linné's behaviour appears to bear testimony of a great psychical elasticity. In fact, even in his periods of depression he showed a remarkably strong sense for reality, and his productivity was even then hardly impaired; the arrival of a batch of plants, the presentation to his mind of a new problem was often enough to restore his balance.

Several authors have judged harshly of Linné's character; they have called him pedantic, overbearing and vain. Others have exalted him as a genius of the first order. My own conclusion, which however should be regarded as preliminary only, and which is offered with all reserve, may be summarized as follows.

Linné was a servant who doubled the talents that were entrusted to him.

The enormous extent of the field in which he moved made it impossible to enter very deeply into the problems which it offered to his inspection; he was, moreover, too little philosophically disposed to do this. However, he gave his pupils an instigation to logical thinking and to see for themselves, and by his own behaviour and by his vision on life

he was to them an inspiring example, and this seems enough to secure him a place, when not among the very few of the first order, at least among the somewhat larger group of those who come next to them.

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AN INDEX NOMINARUM CHARACEARUM — GENERAL IMPLICATIONS

by *)

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In announcing the completion of the manuscript for an index to names of Characeae, the writer senses a feeling of real achievement. Yet, whether this work will fill the need for which it is intended depends to a large degree on the manner in which it is used. Before discussing its applications, some background thoughts may not be out of place.

Taxonomic methods are unique to neither botany nor biology. They are normal attributes of every walk of life. For example, in the case of ordinary machine bolts, the clarity and uniform acceptance of designations for each of the different kinds of bolts might well make the biologist wonder why his system is so fraught with difficulties. Even the cataloguing of books in our libraries, especially those libraries which employ standard decimal systems of classification and nomenclature, seems well integrated and understood. On analysis, it appears that the features of the systems employed which render these industrial taxonomies so efficient are the result of one of two situations: either (1) the products are uniform replicates of one another, as in the case of the bolts, such that they fit into a constant classification system; or (2) a general method of classification has been established into which all units are forced to fit, as in the case of the library books.

In biology, on the other hand, neither of these two conditions, replication or a fixed classification system, obtains. In the first instance, the individual entities are not duplicates of one another, and an endless array of variation and intergradation meets the student's eye wherever he turns. These variants do not fit neatly into a pigeon-hole type of classification system. In the second instance, no single method of classification has proved sufficiently all-encompassing and foresighted to be workable for all groups of organisms over any great periods of time. Further, in biology an additional complication exists, that of the continual progress being made in uncovering new principles and in developing new tools and methods for study.

Thus, the very method of classification for any group of organisms has not as yet become constant, and it is likely that it will not become constant in man's foreseeable future until that unlikely day when everything about biology and the methods of studying biology is known. This inference needs emphasis, and the writer believes that in biology, classification can not be held constant over any considerable period of time.

*) A paper read at the meeting of the Phycological Society of America at Ithaca, New York, Sept. 9, 1952.

Nevertheless, consistency is needed so that a name for a plant can be recognized as having a particular significance in terms of some specified population.

Any system of nomenclature which is employed in biology must be a remarkable one indeed. It should be (1) capable of being universally accepted, and (2) be adaptable to changes in classification. The "type method", together with the principle of priority, as outlined in the "International Code of Botanical Nomenclature" seems to be the only method yet developed which meets both of the above requirements. It also has the golden merit of resting upon a critically factual basis.

Before going further into the factual basis of the type method, a moment's review of the author's attitude of taxonomy might be tolerated. All too often the ease of taxonomic operation lulls the worker into forgetting the machinery by which it operates. Taxonomic progress is achieved through two major and distinctly separate projects which include classification and nomenclature. Classification is here construed to be that project of progressive subdivision of units into smaller and smaller categories. The units may be bolts or plants or specimens of Characeae. Regardless of the method or methods employed in deciding how to classify the entities, be they comparative morphology, phylogeny, culture techniques, biochemistry, biosystematics, cytogenetics, or paleobotany, the net result leads ultimately to classification.

Nomenclature, on the other hand, involves the assigning of names to the categories which have been detected through classification. Totally different techniques are employed. Nomenclature is based upon the application of law and not upon observations or upon the results of experimental techniques.

A third aspect of taxonomic endeavor which has been omitted intentionally is that of identification. Identification involves the assigning of names to unknown specimens on the basis of some accepted system of classification and nomenclature. In this sense, identification is not a part of progressive taxonomy, but is a technique of stating opinions at a taxonomic *status quo*.

On careful consideration of the two aspects of a progressive taxonomy — classification and nomenclature — certain truths become self-evident. As indicated above, classification systems will probably never become completely satisfactory. A continuum of changes in methods of classification of any group of organisms results as more and more students study more and more specimens. Theoretically, the increasing sampling of specimens should bring the general knowledge of a given group asymptotically closer to the real nature of the population under scrutiny. As new tools and methods of study and interpretation are developed, classification may be worked out on totally new bases. It would seem that classification systems for plants can not be held without change. This sequence of change is a symptom of healthy growth in knowledge. Lack of change tends to be a symptom of lack of work and resulting stagnation at some level of progress.

Nomenclature is construed to be the task of assigning one correct name to each category. The type method implies that generally one specimen, the holotype, bears its name without question. All other specimens are assigned the same name only as opinions of some worker. The holotype is a fact. The names borne by other specimens are merely opinions. That type specimen which bears the oldest legitimate name in a given taxonomic circumscription is accepted as providing the correct name for the taxon.

The simplicity of this method is a real tribute to those men responsible for its development. The potential result of its application is beautiful to consider. All students, for instance, having access to the same facts, using the same method of classification, and following the same laws or code, will arrive at the same conclusion as to the correct name. One might call this condition one of consistency of nomenclature. Consistency of nomenclature, then, is construed to be the condition that could exist when all workers using the same facts and methods arrive at the same correct name.

Where does stability and "fixity" of names fit into this picture? Classification, we admit, must be allowed to change. Thus, classification is nonconstant. Nomenclature, on the other hand, must be consistent, but it can not be constant if the classification system underlying it is allowed to change. Therefore, stability, in its broad sense, i.e., no further changing of names, is an untenable goal. What is actually sought, and apparently implied by the usage of "fixity" in Art. 4 of the present Code, is consistency of nomenclature, not stability of nomenclature.

In order for consistency to be achieved, certain concrete realities must be available to all students concerned. These realities in-

clude facts and laws. The facts required include a knowledge of the type specimens and a knowledge of publications of names with dates of publication and description. The laws are at present provided by the Code. Inconsistency can be expected when any one of these realities is not available or not employed.

Sources of difficulty in approaching a consistent nomenclature can readily be detected. Continued changes in the wording of the Code can effect large changes in the nomenclatural system. Such changes must be kept to a minimum if consistency is to be achieved. The refusal of an "authority" to follow the dicta of the code is a barrier to the normal progress toward consistency. Another aspect of authoritarianism is the tradition which surrounds the products of certain well-known workers, and whose nomenclatural lapses of consistency are retained by their following in what appears to be unrecognized disregard of the normal progress toward consistency. On the other hand, the necessary changes in names which result as nomenclature is effectively adapted to changes in classification are often misconstrued to be an undesirable product of modern classification. To the contrary, this is not caused by an inconsistent nomenclature. It is the result of change in classification, and the source of the supposed "difficulty" must be recognized as having nothing to do with the operation of nomenclature.

Two other difficulties must be considered in light of operation of a consistent nomenclature. These two popular techniques for by-passing the progress that could normally be expected are conservation of names and the acceptance of new starting points of nomenclature. Certain faulty logic seems inherent in numerous proposals involving both of these techniques. One idea is that such expedients relieve the worker from having to assemble and study the facts (types and names). A second idea is that classification has become constant for a given group. This idea is generally obscured in the more delicate phraseology such as "the taxonomy of this group is well known". A third of course, is that reliance upon authority can somehow replace the necessity for normal progress in this science.

Regardless of the technique for dodging work, or for other purposes, which may be employed, difficulties are to be anticipated. Such difficulties have been demonstrated all too frequently by the "de-conservation" and "hyper-conservation" required in the numerous cases of unwise (i.e., where the facts were not known) conservation of names. The fretting of mycologists under the new Friesian starting point also has been a case in point which is particularly interesting to observe. Where such troubles arise, taxonomists are forced right back to the task which they may have sought to avoid, namely that of assembling and studying the facts.

On the assumption that consistency of nomenclature is a major objective of modern taxonomy, one may ask how consistency can be achieved in the Characeae (or in any other group of plants). The tasks facing the monographer include classification and nomenclature. With respect to nomenclature, he must locate or select the type specimens, locate and determine the date of publication of each legitimate name, and select the correct name from among the synonyms included in his taxa on the basis of priority.

For the past twelve years the writer has been engaged in the tasks of a monographer as outlined above. Progress can be reported in each phase, but his effort has now produced a list of names which is arranged alphabetically as an index. There are over three thousand names gleaned from over a thousand publications on Characeae. The author for each name refers the reader to an entry in an annotated bibliography. The libraries in which rare volumes were found are indicated. The illegitimate names are so indicated, and the rule which is violated is cited. In this index, then, is compiled one of the two sets of facts needed for solving problems of nomenclature. Without these facts, such problems are solved all too frequently on tradition or conjecture.

It is felt that with this index, students of Characeae may well be enabled to achieve nomenclatural consistency in a minimum of time. The heavy burden of bibliographic checking has been reduced to occasional checking of the factual contents of the index, a checking facilitated by the completeness of the citation of literature. The index is not intended to provide a series of fixed names, and certain workers may be disappointed that it is so arranged as to be practically incapable of being adapted to that thwarted purpose. It is designed as a tool which in the hands of a monographer will speed his work toward consistency; but by providing author citations, opinions of various workers of the past, and citations of literature, it will

prove of value for each worker whose endeavors touch the Characeae. If shortcut and name-stabilizing legislation can be prevented, and if blind acceptance of authority can be replaced by reliance upon facts; it can be predicted that in the near future a significant acceleration in the progress toward a workable taxonomic treatment of Characeae through the efforts of numerous workers will be witnessed.

Transliteration of Cyrillic for use in botanical nomenclature

I. Materials for a Proposal to be submitted to the Paris Congress

by

Jiří Paclt (Bratislava)

The world-wide use of Roman characters in scientific and other literature makes it desirable to introduce a uniform method of transfering words from relatively less important script systems, in which non-Roman symbols are used, into the chief alphabet of the civilized world. Modern Cyrillic is one of these minority scripts, although one of great importance. It is used in the Slavic languages: primarily Russian, Bulgarian and Serbian.

There are two methods of transferring printed or written words from one alphabet to another; viz. 1° rendering by "transcription", and 2° by "transliteration". What is transcription? It consists generally speaking in establishing a sound-system of symbols embracing the range of sounds encountered in human speech, and substituting symbol for symbol, in the case of romanization, therefore, by the respective phonetic values of a Roman script system.

In this discussion, however, transcription is passed over as practically less important to the problem before us. It may interest rather specialized phoneticians, especially language students and instructors, but in the field of philology as applied in biology it is but of limited interest.

On the other hand, the act of transliteration is well characterized by the saying "letter for letter", which means an equivalent substitution of the letters of one alphabet for those of another one. When a transliterator looks to the phonetic needs of the languages into and from which he is transliterating, we designate the procedure as conventional or national rendering. The transliterator, in order to use this method, has to decide whether he wishes to follow this principle of sound for sound (phonetic rendering) or that of letter for letter. He usually decides on a compromise between the two (Fig. 1, note "Mezhdunarodnaja kniga" and "Vsesojuznoje objedinenije" respectively). Thus, the rendering of Slavic words into English phonetic values, including those of the Cyrillic group, may serve as an example of this type of compromise in transliteration. Not every one can be called Smith (Engl.), Compte (Fr.), ... etc. The transcription (*not* transliteration) of these words or names does not vary as a rule in different languages in which the Roman alphabet is used. On the other hand, proper names of the Slavic, and especially of the Cyrillic group, may vary very much when they are transliterated or transcribed abroad; this is due to the fact that some unfamiliar superscript is added to definite sounds of the original language; the adding of diacritical marks on Roman letters, in order to render certain Cyrillic sounds, for instance, leads in many languages to the transcribing or transliterating of Slavic names in conformity with a conventional principle, which varies according to the phonetic character of their alphabet. The reader finds the Czechoslovakian family name Beneš misspelt in most foreign print: Benesh (Engl.), Benesch (Fr.), Benesch (Germ.), Benes (Hung.), Benesz (Pol.), etc.

It seems absurd to give preference to one of the existing world languages as the versions mentioned above will always remain strictly national; therefore, only the official form of name should be considered internationally valid. But this rendering certainly causes no unsurmountable difficulties.

Because of structural language affinities an international system of transliteration has been proposed for nearly all languages written

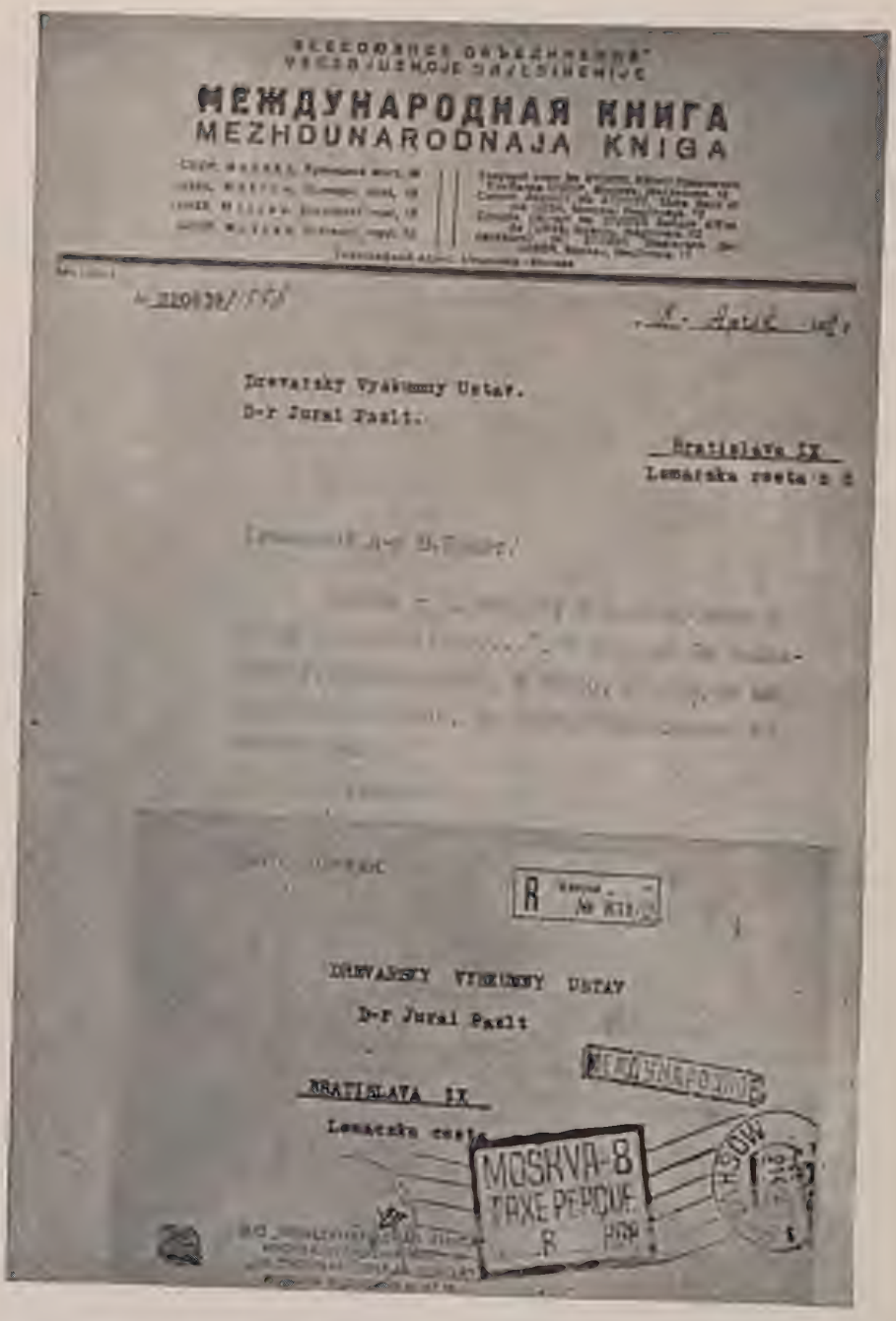

Fig. 1. A compromise translation of Cyrillic in a Russian letter: no diacritics used (zh instead of ž in the word *Mezhdunarodnaja*) as in an English rendering, but in accordance with an international system in other respects.

in non-Roman symbols. These international systems of transliteration can and should be adopted for scientific purposes. In determining the form of an international romanization system, the following points must be kept in mind:

I) Romanization is the only method of scientific transliteration that need be considered; rendering the sounds in a non-Roman system remains on the contrary, a question of national transliteration: e.g., the procedure of cyrillization (rendering in Cyrillic characters). The adoption of a romanized international system seems to be indicated by the fact that the Roman alphabet is most widely used in the civilized world.

II) The method of scientific transliteration must work smoothly in both directions, i.e. into and out of each language. If the system is good, it will permit a nearly precise retransliteration: naturally not every one will be able to make use of the advantages of such a system, but when one has an elementary knowledge of the language from which the transliteration has been made, the rendering will become almost flawless.

III) An important further step would be the rendering of letter for letter, no matter in how far the phonetics of the symbol may graphically be expressed.

IV) Should no language affinities in relation to a Roman alphabet be present, some other feature will have to decide the method of transliteration. Of primary importance is the relative frequency with which a language using Roman symbols is used in the national method of transliteration. (A rule for the international transliteration of Japanese, etc.).

The chief line upon which the international system should be based, is the principle of language affinity. From this point of view, there are no doubts with regard to the application of the system. As for some technical provisions, however, several difficulties have attended the work of the transliterator. The present article, therefore, attempts to clear up the old, often called "chaotic" problem.

The story of the international romanization of Cyrillic goes hand in hand with the development of diacritical marks. It was John Hus (1369-1415), the great Czech reformer, who developed diacritics into an ingenious system, thus replacing the old digraphic orthography by a new, concise alphabetical order. His invention was no work of chance. The Latin alphabet did not and does not symbolize a considerable number of the sounds occurring in several of the European languages, and could not, therefore, express sufficiently well a Slavic language such as the Czech one. In a tract "De Orthographia Bohemica" Hus wrote (about the year 1405) that he preferred diacritics to the digraphs of that time, with the exception of the "ch" (= kh). Hus found this sound very distinct, but because "ch" appeared in Latin itself, though in words of Greek origin only, and still arranged under "c", he introduced no special symbol for it: "... posui *c* cum *h* together, I called that letter *kh*, and to avoid difficulties in learning as well as changes in books, I did not wish to devise a new symbol".

The alphabet of Hus was later imitated by Vuk St. Karadžić (1787-1864), an eminent linguistic authority and the founder of the modern Croatian alphabet for the language of Croatia and Slovenia, where diacritics were introduced for official use (in 1835).

At a later date Slavic diacritical alphabets have served as a model for two Baltic languages (Lithuanian and Lettish). Lithuania and Latvia have now used diacritics in their reformed orthographic systems for approximately 30 years. In 1935, two diacritics (*š* and *ž*) were officially adopted in the Finnish alphabet. As a curiosity it may be noted that the following rhyme was supplied by the Society for Finnish Literature as a guide to the Finnish people:

As the word "frakki" (means frac),
Must'nt be written "phrakki",
By the same reason, please don't write
Any more "shakki" (feans chess),
but "š a k k i".

Some proposals to introduce the diacritic *š* into the Albanian alphabet came to naught. But the considerable success of the Hus alphabet is reflected in its use in numerous scientific romanizations of Oriental scripts, e.g. Sanskrit, Persian, etc.

The importance of diacritics for the nomenclature may be inferred from the following table (Paclt 1952, somewhat amended since that time and slightly modified):

Writing	Rendering for purposes of scientific documentation (nomenclature included)		Examples with special reference to the nomenclature in biology
Non-alphabetical writing systems	Romanization (s. lat.)	Alphabetization	In agreement with Appendix "G" of the Int. Rules of Zool. Nomenclature.
Alphabetical script systems with non-Roman symbols		Romanization (s. str.)	Transliteration of Cyrillic (a scheme using diacritics being proposed already for use in zoological nomenclature — PACLT (1950, 1952); Transliteration of Greek words, e.g. κρόκος = krókos (simply romanized) = crocus (romanized and latinized) — PACLT (1951), BUCHANAN (1953).
Alphabetical systems with Roman symbols	Rendering without any change in typography		In agreement with Appendix "G" of the Int. Rules of Zool. Nomenclature; diacritics should be maintained.

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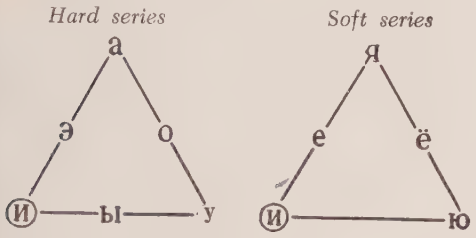
II. Proposal no. 33 submitted to the Paris Congress

As the Babylonian confusion of tongues was neither a freak of nature nor a work of chance, and as writing is a function allied to speech, we cannot hope to change the existing polymorphism of the script by introducing a definite transliteration system. Transliteration remains an auxiliary method and attempts to transliterate large texts (Russian books on botany printed abroad in Roman characters) appear ludicrous.

The systems of international transliteration should, of course, be applied for scientific purposes only. But in that sphere of action, international transliteration should be without limitation as to its use. The only exception are proper names that have been cyrillized: in that case there is no reason to render them in a form corresponding to their cyrillization. For example, the Russians spell foreign names phonetically (ŠEKSPIR for SHAKESPEARE). It would be absurd to follow the rules of romanization in such cases. For the proper name that is to be romanized the transliterator should always investigate the origin. Before the system of transliteration is applied, the bibliographer, of course, may add the de-cyrillized form of the foreign name in brackets, e.g. SHAKESPEARE (ŠEKSPIR).

Critical sounds

The principal Russian vowels fall into a hard series and a corresponding soft series:



The и, which in the schemes above is surrounded by a circle, falls into both the hard and soft series; when и occurs either after a vowel or after ь in the middle of a *single* word, it pertains to the soft series, and must be transliterated accordingly:
ильин = Il'jin, окраина = okrajina, but естествоиспытатель, a composite of естество and испытатель, must be transliterated jestestvoispytatel' (semi-initial position of и).

The е represents a sound closely related to that of the preceding и. Only when it appears as an initial or semi-initial letter, it differs phonetically. Initially, or at the beginning of a syllable in the middle of a word, е has to be transliterated as je. For instance: Евгений = Jevgenij; Достоевский = Dostojevskij; Арсеньев = Arseńjev.

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* * *

From the historical point of view, it is interesting to note that the international system of transliteration of Cyrillic was devised in 1900 for use in the *International Catalogue of Scientific Literature*, and that many German annual bibliographies accepted that system since the publication of the paper by Kuhn & Schnorr. In botany, it is now accepted by the Commonwealth Forestry Bureau *(Forestry Abstracts)* and by the Commonwealth Bureau of Plant Breeding and Genetics *(Plant Breeding Abstracts)*. It is promulgated also for use in the preparation of the *Index Botanicorum* (Verdoorn 1944).

WHEREAS Russian proper names i.e. (both geographic and family names) may serve in the denomination of many new taxa.

AND WHEREAS the actual edition of the "International Code of Botanical Nomenclature" does not contain any Recommendation with regard to the way in which Russian words are to be transliterated.

I, THEREFORE, wish to submit the following Proposal for an Appendix to the Code.

Cyrillic letter		Roman letter		Observation
А	а	A	a	
Б	б	B	b	
В	в	V	v	
Г	г	G	g	In alphabets other than Ukrainian & White Russian.
		H	h	Only in the Ukrainian & White Russian alphabets.
Ґ	ґ	G	g	Obsolete letter.
Ѓ	ѓ	Ǵ	ǵ	Occurs only in the Macedonian alphabet.
Д	д	D	d	
Ђ	ђ	DJ	dj	Occurs only in the Serbian alphabet.
Е	е	E (JE	e je)	In the Russian & White Russian alphabets: Initially, or at the beginning of syllables (after a vowel, a ь or a ъ), E (e) has to be rendered as JE (je).
		E	e	In alphabets other than Russian & White Russian.
Ё	ё	E (JE	e je)	Occurs only in the Russian & White Russian alphabets: for the rendering by JE (je), see the Russian letter E (e).

Cyrillic letter		Roman letter		Observation
Є	є	JE	je	Occurs only in the Ukrainian alphabet.
Ж	ж	Ž	ž	
З	з	Z	z	
И	и	I (JI.	i ji)	In the Russian alphabet: At the beginning of a syllable (after a vowel, a ь or a ъ), but not as an initial sound, either of a free word or of a word that forms part of a compound word, и has to be rendered as JI (ji).
		I	i	In the Bulgarian, Serbian & Macedonian alphabets.
		Y	y	In the Ukrainian alphabet.
І	і	I	i	In Russian obsolete, but still present in the Ukrainian alphabet.
		I (JI	i ji)	In the White Russian alphabet: for the rendering by JI (ji), see the Russian И.
Ї	ї	JI	ji	Occurs only in the Ukrainian alphabet.
Й	й	J	j	
J	j	J	j	Occurs only in the Serbian & Macedonian alphabet.
К	к	K	k	
Ќ	ќ	Ќ	ќ	Occurs only in the Macedonian alphabet.
Л	л	L	l	
Љ	љ (ɬ)	LJ	lj	In the Serbian alphabet.
		Ĺ	ĺ	In the Macedonian alphabet.
М	м	M	m	
Н	н	N	n	
Њ	њ (ń)	NJ	nj	In the Serbian alphabet.
		N′	ń	In the Macedonian alphabet.
О	о	O	o	
П	п	P	p	

Cyrillic letter			Roman letter		Observation
Р	р		R	r	
С	с		S	s	
Т	т		T	t	
Ћ	ћ	(ć)	Ć	ć	Occurs only in the Serbian alphabet.
У	у		U	u	
Ў	ў		Ŭ	ŭ	Occurs only in the White Russian alphabet.
Ф	ф		F	f	
Х	х		CH	ch	In alphabets other than Serbian.
			H	h	Only in the Serbian alphabet.
Ц	ц		C	c	
Ч	ч		Č	č	
Џ	џ	(ǵ)	DŽ	dź	Occurs only in the Serbian & Macedonian alphabets.
S	s		DZ	dz	Occurs only in the Macedonian alphabet.
Ш	ш		Š	š	
Щ	щ		ŠČ	šč	In alphabets other than Bulgarian.
			ŠT	št	In the Bulgarian alphabet.
Ъ	ъ		Disregarded		In alphabets other than Bulgarian.
			Ă	ă	In the Bulgarian alphabet: In the middle of a word.
Ы	ы		Y	y	
Ь	ь		′	′	
Ѣ	ѣ		Ě	ě	Obsolete letter.
Э	э		E	e	
Ю	ю		JU	ju	
Я	я		JA	ja	
Ѳ	ѳ		F	f	Obsolete letter.
Ѵ	ѵ		Y	y	Obsolete letter.
Ѫ	ѫ		Ă	ă	Obsolete letter.

MODIFICACIONES AL CODIGO INTERNACIONAL DE NOMENCLATURA BOTÁNICA

Proposals nos. 34-38 submitted to the Paris Congress*

por

Antonio Ponce de León y Aymé y Maria Teresa Alvarez y Estrada (La Habana)

Proposicion no. 34

MODIFICACION DEL NOMBRE DEL CODIGO

Por cuanto:

El Código Internacional de Nomenclatura Botánica debe tener un nombre mas preciso de acuerdo con su contenido.

Por cuanto:

En este Código no se trata de otra cosa que de la Nomenclatura Taxonomica, es decir, de los nombres relacionados con las unidades taxonómicas.

Por cuanto:

La Nomenclatura de que tratamos solo es un auxiliar de la Taxonomia.

Formulamos la siguiente

PROPOSICION

Que el nombre

CODIGO INTERNACIONAL DE NOMENCLATURA BOTANICA

sea sustituido por

CODIGO INTERNACIONAL DE NOMENCLATURA TAXONOMICA BOTANICA.

Proposicion no. 35

FORMACION DE UN CAPITULO PRELIMINAR

(Bases del Código)

Por cuanto:

Un Código no es un simple conglomerado de reglas, sino un conjunto armónico de normas que exige, en primer término, una distinción entre sus fundamentos y la sucesión numerada de artículos que constituyen la parte ejecutiva o preceptos a seguir.

Por cuanto:

Un verdadero Código no puede tener el motivo de su existencia y sus fundamentos involucrados en sus artículos, sino en un capítulo preliminar o de bases, sobre las cuales ha de desenvolverse después el articulado.

Proposal no. 34

MODIFICATION OF THE NAME OF THE CODE

Whereas:

The International Code of Botanical Nomenclature should have a more proper name more in accordance with its contents.

Whereas:

In this Code no other matter is considered but Taxonomic Nomenclature, that is, the names that pertain to the taxonomic units.

Whereas:

The Nomenclature we deal with is only an aid to Taxonomy.

We present the following

PROPOSAL

That the name

INTERNATIONAL CODE OF BOTANICAL NOMENCLATURE

be substituted by

INTERNATIONAL CODE OF BOTANICAL TAXONOMIC NOMENCLATURE.

Proposal no. 35

OF THE FORMATION OF A PRELIMINARY CHAPTER

(Base of the Code)

Whereas:

A Code is not merely a conglomerate of rules, but a well organized body of articles that demands, in the first place, a distinction between its basic principles and the numbered continuity of articles which form its executive part or the specific rules to be followed.

Whereas:

A real Code does not contain the motive of its existence and the principles involved in its articles, but gives in a preliminary chapter the base on which these specific rules shall be constructed.

*) The Spanish text of this proposal is the primary one.

Por cuanto:

El capítulo preliminar o de bases caracteriza, de acuerdo con el espiritu de orden que supieron imprimirla los romanos o toda legislación que se denomine Código.

Formulamos la siguiente

PROPOSICION

Que el Código Internacional de Nomenclatura Taxonómica Botánica se inicie con un Capítulo Preliminar o de bases, donde se consignen los principios en que se funda, el cual debe llevar el siguiente título:

CAPITULO PRELIMINAR

Bases del Código: Definiciones y Principios fundamentales.

Proposicion no. 36

INTEGRACION DEL CAPITULO PRELIMINAR

PROPOSICION

Que el Capítulo Preliminar del Código Internacional de Nomenclatura Taxonómica Botánica quede integrado de la manera siguiente:

CAPITULO PRELIMINAR

Bases del Código: Definiciones y Principios fundamentales.

I. *Necesidad del Código.*

La Taxonomía Sistemática en Botanica requiere para su desenvolvimiento un sistema de nomenclatura que esté en armonía con el proceso mediante el cual se van estableciendo las sucesivas unidades taxonómicas al llevarse a cabo un ordenamiento de las innumerables y variadas formas que integran el mundo vegetal.

De aquí la necesidad de un verdadero Código que obligue a los botánicos de todos los paises a seguir las mismas normas nomenclaturales, evitando el caos que, sin los debidos preceptos orientadores comunes, habría de producirse.

II. *Característica esencial.*

El Código Internacional de Nomenclatura Taxonómica Botánica ha de ser, ante todo, sencillo y claro, para que sea comprendido y aplicado sin dificultad, así como también preciso y con los preceptos debidamente concatenados para su mas fácil y recta interpretación.

Whereas:

The preliminary chapter or base gives the guiding principles, in accordance with the sense of order that the Romans impressed to all legislation to which the name Code was given.

We present the following

PROPOSAL

That the International Code of Botanical Taxonomic Nomenclature begins with a Preliminary Chapter or base, where the principles on which it is founded are stated and which should bear the following name:

PRELIMINARY CHAPTER

Base of the Code: Definitions and Guiding Principles.

Proposal no. 36

FORMULATION OF THE PRELIMINARY CHAPTER

PROPOSAL

That the Preliminary Chapter of the International Code of Botanical Taxonomic Nomenclature be read as follows:

PRELIMINARY CHAPTER

Base of the Code: Definitions and Guiding Principles.

I. *Of the necessity of the Code.*

Systematic Taxonomy in Botany requires for its development a system of nomenclature which should be in accordance with the process by which the successive taxonomical units are formed, when the innumerable and various forms that compose the vegetable world, are arranged.

Therefore there is a necessity for a real Code which will force botanists in all countries to follow the same nomenclatural rules, avoiding in this way the difficulties that would arise in the absence of such common guiding precepts.

II. *Essential characteristics.*

The International Code of Botanical Taxonomic Nomenclature should be clear and simple for its easier comprehension and application; in addition it should be accurate and its rules should be suitable arranged for a more easy and correct interpretation.

III. *Propósitos del Código.*

Además de la finalidad básica consignada, y en relación con ella, se consideran como propósitos fundamentales o principios en que deben descansar los preceptos del Código, los siguientes:

1. Aspirar a la fijeza de los nombres adecuados.
2. Evitar o rechazar el empleo de formas y de nombres inapropiados que puedan ser causa de error o ambigüedad, o llevar confusión a la ciencia.
3. Evitar la creación inútil de nombres.
4. Procurar la coreccion gramatical, regularidad y eufonía de los nombres.

IV. *Clases de prescripciones.*

Las prescripciones de que consta el Código Internacional de Nomenclatura Taxonomica Botánica pueden ser: *principios, reglas, recomendaciones, notas* y *regulaciones.*

Los principios no pueden formar parte del articulado: son los conceptos básicos en que descansa el Código, que sirven de fundamento a las reglas y a las recomendaciones. Constituyen el Capítulo Preliminar de Fundamentos del Código.

Las reglas son los preceptos concretos y terminantes que rigen la nomenclatura. A fin de poder ordenar la nomenclatura del pasado, tienen efecto retroactivo, a menos que este se limite específicamente. En lo adelante ningún nombre o forma de nomenclatura en desacuerdo con una regla puede mantenerse. Ellas constituyen la parte esencial del articulado.

Las recomendaciones tratan generalmente de puntos secundarios y tienen como finalidad dar mayor uniformidad y claridad a la nomenclatura del porvenir. Los nombres y las formas de nomenclatura contrarios a una recomendacion no pueden ser rechazados, pero tampoco deben ser imitados.

Las notas son explicaciones que se hacen a las reglas para su mejor comprensión y aplicación.

Las regulaciones son normas que deben seguirse para la debida aplicación de ciertas reglas.

V. *Extensión del Código.*

La Nomenclatura Botánica es independiente de la nomenclatura zoológica, a tal extremo que el nombre de una planta no puede ser rechazado porque sea idéntico al nombre de un animal. No obstante, si un organismo es transferido del reino animal al

III. *Purposes of the Code.*

Besides the basic aim previously stated, and in relation with it, we consider the following principles, on which the Code concepts are based fundamental:

1. To aim at fixity of adequate names.
2. To avoid or to reject the use of improper names and forms which may cause error or ambiguity or throw science into confusion.
3. To avoid the useless creation of names.
4. To aim at grammatical correctness, regularity and euphony of names.

IV. *Kinds of Maxims.*

The maxims of the International Code of Botanical Nomenclature may be *principles, rules, recommendations, notes* and *regulations.*

The principles should not be included in the articles: they are the basic concepts on which the Code rests and are the foundation for the rules and recommendations. Therefore, they form the fundamental Preliminary Chapter of the Code.

The rules are the concrete final precepts that govern nomenclature. In order to put the nomenclature of the past into order, they have a retroactive effect, unless expressly limited. From now on no name or form of nomenclature contrary to a rule can be maintained. They form the essential part of the set of precepts.

The recommendations deal generally with subsidiary subjects and have the purpose of giving a greater uniformity and clarity to the nomenclature of the future. Names or forms contrary to a recommendation cannot on that account be rejected, but are not examples to be followed.

The notes are explanations added to the rules for their better comprehension or application.

The regulations are norms that must be followed for the correct application of certain rules.

V. *Extent of the Code.*

Botanical Nomenclature is independent of zoological nomenclature in the sense that the name of a plant must not be rejected merely because it is identical with the name of an animal. If, however, an organism is transferred from the animal to the plant king-

reino vegetal el nombre, si su publicación es válida, debe ser aceptado en Botánica bajo la forma prescrita por la nomenclatura botánica y si un organismo es transferido del reino vegetal al reino animal el nombre conservará, en la Nomenclatura Botánica, el estado y rango que le corresponde.

VI. *Lenguaje.*

Los nombres científicos de todos los grupos taxonómicos se toman preferentemente del Latin o del Griego. Cuando provienen de otra lengua que no sea el Latín, o se formen de manera arbitraria, serán tratados como si fueran del Latín. Las terminaciones latinas deben usarse tanto como sea posible para los nuevos nombres.

VII. *Nota circunstancial.*

En ausencia de una regla, o cuando el contenido de una regla sea de aplicación dudosa, lo establecido por el uso debe servir de guía.

Discusion

El artículo No. 1 del Código anterior es de una pobreza extremada. Además, da a entender que se va a tratar de toda la Nomenclatura Botánica, lo que no es verdad. Se sustituye por el párrafo (I), *Necesidad del Código,* lo que no necesita una explicación mas amplia.

El Art. No. 2 del Código anterior tiene una redacción algo extraña: dice que el Código se basa en sus preceptos, lo que no es correcto, y resulta además incompleto. Proponemos su substitucion por el párrafo (IV) *Clases de prescripciones.*

Este párrafo se ha situado en el lugar que lógicamente le corresponde, es decir, después de indicar las finalidades del Código. En él, además de distinguir fundamentalmente los principios, se ha indicado la existencia de notas y regulaciones, lo que no se hacía antes.

El Art. No. 3 del Código se mantiene bajo el título (II) *Caracteristicas esenciales,* pero ampliado debidamente.

El Art. No. 4 del Código se coloca en un lugar principal con el nombre de (III) *Propósitos del Código.* Se ha ampliado su incisom (1) y se han limitado el (3) y el (4) quitándoles, además, la parte negative y la porción explicativa, que no deben formar parte de un principio.

dom, its validly published names are to be accepted as botanical nomenclature in the form prescribed by the rules of botanical nomenclature, and if an organism is transferred from the plant kingdom to the animal kingdom, its names retain their status in botanical nomenclature.

VI. *Language.*

Scientific names of all taxonomic groups are usually taken from Latin or Greek. When taken from any language other than Latin, or formed in an arbitrary manner, they will be treated as if they were Latin. Latin terminations must be used as far as possible for new names.

VII. *Circumstantial Note.*

In the absence of a rule or where the consequences of rules are doubtful, established custom must be followed.

Discussion

Art. No. 1 of the Code is extremely poor. In addition, it seems to mean that all Botanical Nomenclature will be dealt with, and that is not true. Its substitution by paragraph (I) *Of the necessity of the Code* does nor require further explanation.

Art. No. 2 of the Code has a somewhat peculiar redaction, claiming that the Code is based on its rules, which is not only incorrect but also incomplete. We propose the substitution of the said article by paragraph (IV) *Kinds of Maxims.*

This paragraph has been placed where it logically belongs, that is, after the indication of the aims or objectives of the Code. In it, besides clearly distinguishing the principles, the existence of the notes and regulations is properly indicated, which has never been done.

Art. No. 3 of the Code is maintained under the title (II) *Essential characteristics,* but it is duly amplified.

Art. No. 4 should be put in a more important place, entitled (III) *Purposes of the Code.* Its paragraph (1) has been amplified and (3) and (4) have been limited by the omission of negative and explanatory parts which should not be included in a statement of principles.

El Art. No. 5 se deja como una *Nota Circunstancial* (VII) del Capítulo Preliminar.

El Art. No. 6 se deja como párrafo (V) con el nombre de *Extension del Código.*

El Art. No. 8 se separa en dos partes que son bien distintas. Los incisos (1) y (2) no son necesarios porque están incluidos en el párrafo (I) *Necesidad del Código.*

Estos incisos limitan la extensión del Código, pues dicen:

La Nomenclatura Botánica trata:

(1) de los terminos que denotan las categorias de los grupos o unidades taxonomicas, y de los rangos relativos de estas categorias.

(2) de los nombres que son aplicados a los grupos taxonomicos individuales.

Por tanto, si determinamos que el nombre del Código debe ser "Código Internacional de Nomenclatura Taxonomica Botánica", huelgan estos incisos.

La última parte de este artículo es, en cambio, de una importancia extremada. Es la primera disposicion ejecutiva del Código: la que determina el nombre (taxon) con que debe designarse a toda unidad taxonómica, que no se concibe como se ha dejado relegada a un simple inciso de un artículo complejo, en lugar de situarla en el lugar que le corresponde: Cap. I. Art. 1.

El Art. No. 9 no tiene razón de ser y debe suprimirse: es una advertencia innecesaria y esteril, no una norma y menos un principio. En cada caso se dan normas para formar los nombres.

El Art. No. 10 del Código no debe formar parte del Capítulo Preliminar, porque no es un principio. Es la enumeración de las condiciones que deben concurrir en el nombre de un taxón para que sea correcto. Por eso su contenido, convenientemente ampliado y ordenado, irá a formar parte de la Seccion 1 del nuevo Capítulo II que trata de la legitimidad y naturaleza de los nombres.

Proposicion no. 37

FORMACION DE LOS PRIMEROS CAPITULOS DEL ARTICULADO DEL CODIGO INTERNACIONAL DE NOMENCLATURA TAXONOMICA BOTANICA.

Por cuanto:

En las modificaciones requeridas para que el Código Internacional de Nomenclatura

Art. No. 5 is maintained as a *Circumstantial Note* (VII) of the Preliminary Chapter.

Art. No. 6 will become paragraph (V) with the title *Extent of the Code.*

Art. No. 8 is divided into two parts that are quite different. The paragraphs (1) and (2) are not necessary for they are included in paragraph (I) *Necessity of the Code.*

These paragraphs restrict the scope of the Code, that is:

Botanical nomenclature deals with:

(1) the terms which denote the categories of taxonomic groups or units, and the relative rank of these categories;

(2) the names which are applied to the individual taxonomic groups.

Therefore, if we have determined that the title of the Code should be "International Code of Botanical Taxonomic Nomenclature", these two paragraphs are superfluous.

The last part of this article is extremely important. It is the first official statement of the Code: it introduces the name "taxon" for all taxonomic units, and it should not have been relegated to a simple paragraph of a complex article, but placed in the proper place: Chap. I. Art. 1.

Art. No. 9 should be suppressed: it is a useless advice, not a rule or a principle. In each individual case norms are given to form names.

Art. No. 10 should not be included in the Preliminary Chapter as it is not a principle. It is a list of the conditions that must be fulfilled in order that the name of a taxon be correct. Therefore its contents, conveniently amplified and ordered, will enter as part of Section 1 of the new Chapter II, which deals with the legitimacy and nature of names.

Proposal no. 37

FORMULATION OF THE FIRST CHAPTERS OF THE PRECEPTS OF THE INTERNATIONAL CODE OF BOTANICAL TAXONOMIC NOMENCLATURE.

Whereas:

In the modifications required to give the International Code of Botanical Nomen-

Botánica pueda adquirir el caracter de un verdadero Código, no es posible limitarse a enmendar artículo por artículo, pues con ellos sólo se conseguiría complicarlo mas, sino que se hace necesario llegar a veces a la reconstrucción de capítulos enteros.

Por cuanto:

Es necesario que los artículos de los primeros nuevos capítulos tengan, además de extremada claridad y suficiente amplitud, el encadenamiento requerido para que no ocurra el hecho de que la explicación de un precepto tenga que ser hecha en artículos posteriores, cosa inadmisible en todo buen código.

Formulamos las siguientes

PROPOSICIONES

a. Que con los preceptos consignados en la parte final del Art. 8 (Cap. I) y los que se encuentran en los artículos 12, 13, 14 y 15 (Cap. II) del Código Internacional de Nomenclatura Botánica, con las modificaciones pertinentes y suficientemente ampliados, se integre el Capítulo II del Código Internacional de Nomenclatura Taxonómica Botánica con el siguiente título:

Capítulo I. DE LAS UNIDADES TAXONOMICAS Y DE LOS RANGOS EN QUE SE SITUAN.

b. Que con los preceptos formulados en el Art. 10 del Cap. I, los consignados en las Secciones 1 y 2 del Cap. II, con las modificaciones y adiciones oportunas y la incorporacion del Apendice I del Código Internacional de Nomenclatura Botánica se integre el Capítulo II del Código Internacional de Nomenclatura Taxonomica Botánica con el siguiente titulo:

Capítulo II. DE LA LEGITIMIDAD, NATURALEZA Y APLICACION DE LOS NOMBRES QUE RECIBEN LOS TAXA.

Proposicion no. 38

INTEGRACION DEL PRIMER CAPITULO DEL ARTICULADO.

PROPOSICION

Que el Capítulo I del Código Internacional de Nomenclatura Taxonómica Botánica quede integrado de la siguiente manera:

DE LAS UNIDADES TAXONOMICAS Y DE LOS RANGOS EN QUE SE SITUAN.

Art. 1. Toda agrupacion que, como resultado de una ordenacion sistemática, tenga

clature the character of a real Code, it has not been possible merely to correct the articles one by one, as this would have created further complications, but it has sometimes been necessary to reconstruct entire chapters.

Whereas:

It is necessary that the articles constituting the first chapters possess, in addition to extreme clarity and sufficient extent, the necessary continuity in order that the explanation of a rule or precept is not given in later articles, this being inadmissible in a good Code.

We formulate the following

PROPOSALS

a. That Chapter II of the International Code of Taxonomic Botanical Nomenclature be made up of the precepts stated in the last part of Art. 8 (Chap. I) and those given in articles 12, 13, 14 and 15 (Chap. II) of the International Code of Botanical Nomenclature, with the pertinent modifications and amplifications, and that this Chapter be given the following name:

Chapter I. OF THE TAXONOMIC UNITS AND THE RANKS TO WHICH THEY BELONG.

b. That Chapter II of the International Code of Taxonomic Botanical Nomenclature be made up the precepts formulated in Art. 10 of Chap. I, those stated in Sections 1 and 2 of Chap. II, with the convenient modifications and additions, and the incorporation of Appendix I of the International Code of Botanical Nomenclature and that this chapter be given the following name:

Chapter II. OF THE LEGITIMACY, NATURE AND APPLICATION OF THE NAMES GIVEN TO THE TAXA.

Proposal no. 38

FORMULATION OF THE FIRST CHAPTER OF THE PRECEPTS.

PROPOSAL

That Chapter I of the International Code of Botanical Taxonomic Nomenclature be formulated as follows:

OF THE TAXONOMIC UNITS AND THE RANKS TO WHICH THEY BELONG.

Art. 1. Any group of plants that, as a result of systematic classification, has been

en Botánica el caracter de unidad taxonómica, recibe el nombre de *taxon* (taxa en plural).

Art. 2. Los rangos en que se consideran o situan los *taxa* o unidades taxonómicas que van surgiendo como consecuencia de la progresiva ordenación sistemática de los vegetales se denominan *categorias taxonómicas.*

Art. 3. Los nombres que reciben las categorias principales, estimadas como imprescindibles por la Taxonomia Sistemática Botánica, son las siguientes:

SPECIES.
(La especie).

Es la categoría básica, donde se consideran ó sitúan los taxa o unidades taxonomicas formados por plantas tan semejantes entre sí que comunmente se designan con el mismo nombre.

GENUS.
(El género).

Es la categoría a que pertenecen los taxa constituidos por la reunión de especies afines. Los generos, por lo regular, son las unidades taxonomicas mejor delimitadas.

FAMILIA.
(La familia).

Categoría o rango donde estan los taxa formados por géneros. Las familias son generalmente unidades taxonomicas muy naturales.

ORDO.
(El orden).

Rango a que pertenecen los taxa formados por familias próximas.

CLASSIS.
(La clase).

Categoría en que se consideran los taxa formados por la reunión de ordenes. Las clases son ya grandes taxa.

DIVISIO.
(La división).

Categoría a que pertenecen las grandes unidades taxonómicas formadas por la reunión de clases. Como su nombre indica, vienen a ser las grandes divisiones que se consideran en el reino vegetal.

REGNUM.
(El reino).

Es la categoría maxima, representada en Botánica por un magno y unico taxon: el conjunto de todos los organismos considerados como vegetales o plantas.

given the character of a taxonomic unit, receive the name of *taxon* (plural: taxa).

Art. 2. The ranks to which the taxa or taxonomic units belong and which arise as a result of the progressive systematic classification of plants are called *taxonomic categories.*

Art. 3. The names of the principal categories, which are considered indispensable in Systematic Botanical Taxonomy, are the following:

SPECIES.
(The species).

This is the basic category for the taxa or taxonomic units consisting of plants so similar to each other that they commonly are designated by the same name.

GENUS.
(Genus).

This is the category for the taxa formed by the union of related species. The genera are usually the best defined of all taxonomic units.

FAMILIA.
(Family).

This is the category or rank for the taxa formed by the genera. The families are usually very natural forms of taxonomic units.

ORDO.
(Order).

This is the rank for the taxa formed by related families.

CLASSIS.
(Class).

This is the category for the taxa formed by the union of a number of orders. The classes are extensive taxa.

DIVISIO.
(Division).

This is the category for the extensive taxonomic units made up of classes. As the name implies, they are considered to be the main divisions of the vegetable kingdom.

REGNUM.
(Kingdom).

This is the uppermost category, represented in Botany by a single large taxon and comprising all the organisms considered to be plants.

Nota.

Siendo imprescindible la consideracion de taxa pertenecientes a las mencionadas categorias principales, de acuerdo con la subordinacion que implica la formacion progresiva de los taxa, podemos decir: toda planta individual debe pertenecer a una especie (species), toda especie a un género (genus), todo género a una familia (familia), toda familia a un orden (ordo), todo orden a una clase (classis), toda clase a una división (divisio) y toda división debe formar parte del Reino (Regnum).

Art. 4. Se aceptan tambien como categorias importantes, aunque no es imprescindible la existencia de taxa pertenecientes a ellas, la tribu (tribus), intermedia entre la familia y el género, y la sección (sectio), subordinada al género, es decir, entre el género y la especie.

Art. 5. Se admiten además, para los taxa que resulten del fraccionamiento de otros taxa de mayor rango, categorias subordinadas cuyos nombres se formarán anteponiendo el prefijo (sub) al de las principales. Asi tendremos: el Sub-Reino (Sub-Regnum); la sub-division (sub-divisio); la sub-clase (sub-classis); el sub-orden (sub-ordo); la sub-familia (sub-familia); la sub-tribu (sub-tribus) y la sub-sección (sub-sectio).

Art. 6. Los taxa considerados como especies, de la misma manera, pueden fraccionarse dando lugar a nuevas unidades taxonómicas de rangos inferiores, de las que se admiten, en descendente secuencia, las siguientes: la sub-especie (sub-species); la variedad (varietas) y la forma (forma).

Art. 7. No obstante el concepto clásico de la especie, al que responden los taxa considerados como especies Linneanas, hay la idea de categorias de taxa que responden a una orientación biosistemática, sin que representen precisamente sub-divisiones de la especie clásica. Así tenemos: la *ecoespecie,* en cuyos taxa se hace patente la influencia del medio, y la *cenospecie,* reunion de ecoespecies cuyos límites parecen estar determinados principalmente por barreras genéticas.

En las especies parasitas se admite, además, la forma especial (forma specialis) de caracter, como es de suponerse, biotaxonómico. Por último, pueden conside-

Note.

Since the sequence of the above-mentioned categories has once and for all been fixed, in accordance with the subordinacy that implies the progressive formation of the taxa, we may say: every individual plant must belong to a species (species), every species to a genus (genus), every genus to a family (familia), every family to an order (ordo), every order to a class (classis), every class to a division (divisio) and every division must be a part of the Kingdom (Regnum).

Art. 4. Other categories are also accepted as important, though it is not indispensable to find taxa belonging to them, viz. the tribe (tribus), intermediary between the family and the genus, and the section (sectio) subordinate to the genus, that is, between the genus and the species.

Art. 5. For taxa resulting when subdividing taxa of higher rank, categories whose names will be formed by adding the prefix (sub) to the name of the higher category, are also admitted. Thus Sub-Kingdom (Sub-Regnum); sub-division (sub-divisio); sub-class (sub-classis); sub-order (sub-ordo); sub-family (sub-familia); sub-tribe (sub-tribus) and sub-section (sub-sectio).

Art. 6. The taxa considered as species, on the other hand, may be subdivided into new taxa of lower rank, of which, in descending sequence, the following are admitted: subspecies (sub-species), variety (varietas) and form (forma).

Art. 7. Apart from the classical conception of the species, viz. the Linnean species, there is the conception of taxa based on biosystematic orientation but which do not correspond precisely to subdivisions of the classical species. Thus: the *ecospecies* for those taxa in which the influence of the environment is evident, and the *cenospecies,* a union of ecospecies whose limits seem to be defined mainly by genetic barriers.

In the parasitic species we recognize moreover the special form (forma specialis) of biotaxonomic character. Finally we can regard as categories, specially in cultivated

rarse tambien como categorias, especialmente en las plantas cultivadas, la *linea* y el *clone,* que representan las categorias inferiores extremas.

Art. 8. El número de categorias puede aumentarse en casos necesarios, procurando asignarles denominaciones que no den lugar a confusión o error. Por ejemplo: se llega a considerar una categoria intermedia entre la sub-clase y el orden, a la que se lleven taxa integrados por grupo de ordenes y la que se puede dar el nombre de *cohorte.* Tambien se suelen intercalar, como categorias intermedias entre la sub-sección y la especie, a la serie y a la sub-serie.

Art. 9. El orden en que deben considerarse las categorias indicadas no puede alterarse, quedando, en resumen, ordenadas estas en forma descendente, de la siguiente manera:

REGNUM.
Subregnum.
DIVISIO.
Subdivisio.
CLASSIS.
Subclassis.
Cohort.
Subcohort.
ORDO.
Subordo.
FAMILIA.
Subfamilia.
Tribus.
Subtribus.
GENUS.
Subgenus.
Sectio.
Subsectio.
SPECIES.
Subspecies. Cenospecies.
Varietas Ecospecies.
Subvarietas.
Forma. Forma specialis.
Linea.
Clone.

Art. 10. Cuando se usa el nombre de una categoría sin ajustarlo a la gradación preceptuada, se estimará como un error inadmisible y, por tanto, no será válida la publicación de los nombres de estos taxa. Ejemplo: dividir un género en familias o una especie en ordenes. Se admite una sola excepción: En la obra del Dr Fries "Systema Mycologicum" los generos se dividen en tribus.

plants, the *line* (linea) and the *clone,* which represent the lowest categories.

Art. 8. The number of categories may be increased when necessary; but then we must try to assign them names which will not lead to confusion or error. For example: we can recognize an intermediate category between sub-class and order, for a group of orders, which may be called *cohort* (cohors). Similarly series and sub-series are intercalated between subsections and species.

Art. 9. The order in which the specified categories are used can not be altered. They retain the following order:

REGNUM (Kingdom).
Subregnum.
DIVISIO (Division).
Subdivisio.
CLASSIS (Class).
Subclassis.
Cohors.
Subcohors.
ORDO (Order).
Subordo.
FAMILIA (Family).
Subfamilia.
Tribus (Tribe).
Subtribus.
GENUS (Genus).
Subgenus.
Sectio (Section).
Subsectio.
SPECIES (Species).
Subspecies. Cenospecies.
Varietas (Variety). Ecospecies.
Subvarietas.
Forma. Forma specialis.
Linea.
Clone.

Art. 10. If a name of a category is used in contravention to the legitimate gradation it will be considered an inadmissible error and, consequently, the publication of the names given to such taxa will be considered as non-valid. Examples: It is not allowed to divide a genus into families or a species into orders. Only one exception is admitted: In Dr Fries' "Systema Mycologicum" the genera are divided into tribes.

Explicación

La porción ejecutiva de este Código debe tener como primer precepto la determinación del nombre que designe en general a toda unidad taxonómica, TAXON, que es la mas amplia disposición nomenclatural efectiva.

Esta disposición, que aparece como nota circunstancial en el artículo No. 8 del Código, no es un principio ni una definición.

El concepto de TAXON fué la nota mas destacada de la Conferencia de Utrecht, debida a la proposición del ilustre botánico taxonomista Dr H. J. Lam. Su importancia es tan notable que el nombre adoptado TAXON se ha tomado para designar a la publicacion oficial de la "International Association for Plant Taxonomy".

Por esta razón, debe constituir el Art. No. 1 del Código Internacional de Nomenclatura Taxonomica Botánica.

El Art. No. 12 del Código anterior tiene el caracter de un dogma mas bien que de un precepto. Expone, en efecto, los conceptos como definitivos: no los delimita ni da orientaciones para formar los nombres, sino que los consigna de manera terminante sin explicación alguna. Es, además, en extremo complejo, sin relacion con los precedentes, y no se ofrece una adecuada distincion entre taxa y categorias. Lo hemos desdoblado en tres artículos, con los números 2, 3, y 4 respectivamente, ordenando los conceptos y haciendo las explicaciones concernientes.

El Art. No. 13 del antiguo Código es en extremo condensado, comenzando con la palabra *finalmente,* no obstante ser sólo el segundo de los que tratan de las categorías taxonómicas. Ha tenido que ser dividido en cuatro partes: la primera será ahora el Art. No. 5; la segunda se encuentra en la nota del Art. No. 3; la tercera se lleva al nuevo Art. No. 8 y la cuarta forma parte del Art. No. 7.

El Art. No. 14 del antiguo Código está consignado en el nuevo Art. No. 6. Su recomendación, aunque de hecho está incluida en el nuevo Art. No. 7, podria no obstante mantenerse al final de éste.

El Art. No. 15 del Código anterior se encuentra incluido en los nuevos artículos Nos. 9 y 10.

Explanation

The executive section of this Code must contain as its first precept the definition of the general term for all taxonomic units, viz. TAXON, which is the most general concept.

This concept, which is mentioned as a circumstantial note in Art. No. 8 of the Code is neither a principle nor a definition.

The most outstanding issue of the Utrecht Conference was the proposal presented by the prominent taxonomic botanist Dr H. J. Lam of the University of Leiden in relation to the concept of the TAXON. Its noteworthy importance is evident from the fact that the term TAXON has been adopted as the title of the official publication of the "International Association for Plant Taxonomy".

For this reason it must be Art. No. 1 of the International Code of Taxonomic Botanical Nomenclature.

Art. No. 12 of the former Code has more the character of a dogma than of a precept. In fact it gives concepts as though they were definite: it does not establish their limitations and gives no directions for forming names; it consigns them definitely and without any explanation. Besides this, it is extremely complex, without connection with the preceding articles, and adequate distinction is not offered between taxa and categories. This article has been split into three, numbered 2, 3 and 4 respectively, in which a list of concepts is given with the pertinent explanations.

Art. No. 13 of the former Code is extremely condensed, starting with the word *finally* although it is only the second of those which deal with taxonomic categories. It has been divided by us into four parts: the first will become Art. No. 5, the second will be found in the note to Art. No. 3; the third has been included in the new Art. No. 8 and the fourth has become a portion of Art. No. 7.

Art. No. 14 of the former Code is included in the new Art. No. 6. Its recommendation could be maintained at the end of the said article, though in fact it is also included in Art. No. 7.

Art. No. 15 of the former Code is included in the new Arts. Nos. 9 and 10.

Propositions pour le Congrès de Paris

Proposal no. 39

Proposal to conserve the generic name **Nothofagus** Blume (Fagaceae).

Nothofagus Blume, Mus. Bot. Lugd.-Bat. 1: 307. 1850, nom. conserv. prop.

Size & Area: C. 40 species described from New Guinea, Australia, Tasmania, New Zealand, Chile, and The Argentine.

Fagaster Spach, Hist. Nat. Vég. Phan. 11: 142. 1842, nom. rejic. prop.

Size & Area: Proposed for some S. American species of Fagus; no binomials have been made.

Calucechinus Hombron & Jacquinot, in Dumont d'Urville, Voy. Pol Sud & Océan. (Astrolabe & Zélée) Bot. Atlas. (Dicot.; sphalm. Monoc.) fasc. 6, t. 6 Θ. 1844, nom. rejic. prop.

Size & Area: Monotypic; Calucechinus antarctica (G. Forst.) Hombr. & Jacq. = Nothofagus antarctica (G. Forst.) Oerst. from Chile & The Argentine.

Calusparassus Hombron & Jacquinot, l.c. t. 6 ≲. 1844, nom. rejic. prop.

Size & Area: Monotypic; Calusparassus forsteri (Hook.) Hombr. & Jacq. = Nothofagus betuloides (Mirb.) Oerst. From Chile and The Argentine.

Discussion of *Fagaster*. — Recently Dr R. C. Bakhuizen van den Brink Jr pointed my attention to the generic name Fagaster Spach, which has, as far as we can trace, neither been mentioned by any later author of Fagaceous papers nor been referred to by cyclopedic standard works. It was described in the briefest possible way by Spach; it was not specially marked by him as a new genus, but still opposed to Fagus by one (non-essential) character, which just saves it from being a nomen nudum. This makes it unfortunately necessary to make a formal proposal to conserve Blume's widely accepted generic name Nothofagus for this important, rather large, arboreous genus, a name which has been in consistent use in botany and forestry for over a century. Taking up the entirely obsolete generic name Fagaster would manifestly upset the stability of nomenclature and involve about 40 new combinations.

Discussion of *Calucechinus* and *Calusparassus*. — For the validity of these two generic names the date of publication of fasc. 6 of the Atlas was of paramount importance, as in fasc. 8, plates 7-8, three additional specific names have been mentioned under these genera. All are provided with detail drawings. Plate 6 contains only one species of each genus, and under art. 50 of the Code both generic names would be legitimate. Mr W. T. Stearn, of the British Museum, generously put the following essential data at my disposal: Jackson (J. Bot. 26: 269-272. 1888) showed the atlas to be published in 13 fascicles between 1844 and 1853. Plate 6 was issued with fasc. 6 and plates 7-8 with fasc. 8. A review (in Hooker's London J. Bot. 3: 128. 1844) establishes conclusively that fasc. 6 appeared in 1844 before fasc. 8 which was reviewed later in the same journal (op. cit. 4: 28. 1845). Hence, both generic names Calucechinus and Calusparassus take their publication as to the names of monotypic new genera from pl. 6 (1844) and thus clearly antedate Nothofagus.

Taking into consideration that both generic names have been reduced very soon after publication by Decaisne who wrote the text belonging to the atlas (1855), that further they have not been taken up later and have been out of use for over a century, and that finally nomenclature of the well known genus Nothofagus which has been in consistent use, would be considerably upset if replaced by one of them, and would necessitate about 40 new combinations, it is considered urgent to conserve Nothofagus.

Recommendation: To conserve *Nothofagus* Bl. over *Fagaster* Spach, *Calucechinus* Hombr. & Jacq., and *Calusparassus* Hombr. & Jacq.

Proposed by: C. G. G. J. van Steenis (Leiden).

Proposal no. 40

Insert the following new Article

Article 78 bis

Epithets of subdivisions of genera are illegitimate and must be rejected when they are formed by attaching the prefix *Eu-* to the generic name, or to that of a higher subdivision of the genus.

Examples. *Baissea* sect. *Eubaissea* K. Schum.; *Bromus* sect. *Eubromus* Godr.

Argument. Such names with the prefix *Eu-* are rejected for *subgenera* (Art. 32), and for *subdivisions of species* (Art. 35), if the taxa to which they are applied include the

type of the next higher taxon. There is still more reason for rejecting them if, as sometimes happens, the taxa concerned do *not* include the type of the next higher taxon. The simplest procedure is to reject all such names for *all* subdivisions of genera, whether these include the type of the next higher taxon or not. There seems to be no reason for treating names of sections or other subdivisions of genera beginning in *Eu-* differently from those of subgenera beginning in *Eu-*.

The above simplified version of Art. 78 bis is designed to replace M. Pichon's proposed Art. 78 bis (1) and (2). Art. 78 bis (3) seems unnecessary: under the type-method, the name *Baissea* sect. *Guerkea* (K. Schum.) Stapf is a nomenclatural synonym of *Guerkea* K. Schum., and it cannot therefore be applied under the Code to a section not including the type-species of *Guerkea*.

Proposed by: T. A. Sprague.

Proposal no. 41

Art. 81

(1) Insert the words "in a new combination" after "adopt" (line 4), and replace "or" (line 6) by "and".

The third sentence will then read as follows:

"When a new epithet is required, an author may, if he wishes, adopt *in a new combination* an epithet previously given to the taxon in an illegitimate combination, if there is no obstacle to its employment in the new position *and* sense; the epithet in the resultant combination is treated as new."

(2) Delete the example of *Sturtia gossypioides*.

Argument. The use of the word "or" (line 6) has led to misinterpretation of Art. 81. The words "resultant combination" indicate clearly that the combination foreseen was a *new* one. An obstacle to the employment of the epithet in this resultant combination might be *either* that the new combination is a later homonym or a tautonym, *or* that in the sense adopted (i.e. with the circumscription of the taxon) another epithet ought to have been adopted under the rules.

The example of *Sturtia gossypioides* was not included in the Stockholm Synopsis, and its insertion under Art. 81 seems to have been due to a misunderstanding resulting from the unfortunate employment of the word "or" instead of "and" in line 6: under Art. 73 an illegitimate name, e.g. *Gossypium Sturtii*, must be rejected; it cannot be legitimized except by conservation. The purpose of the third sentence of Art. 81 was to legitimize new combinations such as *Calandrinia polyandra* Benth., in which the epithet *polyandra* had been previously used in an illegitimate combination, by the legal fiction of treating them as new names.

Proposed by: T. A. Sprague.

Proposal no. 42

Recommendation 83F

Magnifications referring to figures of vascular plants should be expressed on a linear basis.

Argument: In present circumstances there may be doubt as to whether magnifications are based on linear or area measurements. It is simpler to calculate and to interpret magnifications on a linear basis and it is desirable to remove possible causes of misunderstanding.

Proposed by: R. A. Dyer (Pretoria).

Proposal no. 43

Proposal for the conservation of the generic name Enneastemon (Annonaceae): *Enneastemon* Exell in Journ. of Bot. 70, Suppl. 1: 209 (1932) versus: *Clathrospermum* Planch. ex Benth. et Hook. f. Gen. Pl. 1: 29 (1862).

Enneastemon Exell, Annonaceae.

Adopted by: Robyns et Ghesquière in Ann. Soc. Sci. Brux. 53 B: 162 (1933); Robyns et Ghesquière in Bull. Mus. Hist. Nat. Par., Sér. 2, 6: 90 (1934); Ghesquière in Rev. Zool. et Bot. Afr. 32: 141 (1939); Exell in Journ. of Bot. 72: 28 (1934); Exell in Journ. of Bot. 73, Suppl. Polypet. Addend.: 6 (1935); Exell in Journ. of Bot. 73: 163 (1937); Exell et Mendonça in Consp. Fl. Angol. 1: 26 (1937); F. W. Andrews in Fl. Pl. A.-E. Sudan 1: 4 (1950); Boutique in Fl. Congo Belge 2: 376 (1951); Keay in Kew Bull. 1953: 71 (1953). About 12 species in tropical Africa.

Type species: *Enneastemon angolensis* Exell (1932) which is a synonym of *Enneastemon seretii* (De Wild.) Robyns et Ghesq. (1933), based on *Popowia seretii* De Wild. (1909).

Clathrospermum Planch. ex Benth. et Hook. f., Annonaceae.

Adopted by: Planchon in Trans. Linn. Soc. 23: 479 (1862); Oliver, Fl. Trop. Afr. 1: 25 (1868); S. Moore in Journ. of Bot. 15: 65

(1877); Prantl in Engl. et Prantl Nat. Pflanzenfam. 3, 2: 29 (1891); Th. Durand et Schinz, Consp. Fl. Afr. 1, 2: 44 (1898). Five species in tropical Africa, 3 of which have binomials under *Enneastemon;* also a sixth species (*C. mannii* Oliv.) which is a *Popowia.*

Type species: *Clathrospermum vogelii* (Hook. f.) Planch. (1862), based on *Uvaria ? vogelii* Hook. f. (1849).

Discussion: Further material of the type species of *Clathrospermum* Planch. ex Benth. et Hook. f. shows that the petals are in a single series with the outer three petals overlapping the inner three in the upper portions, exactly as in *Enneastemon* Exell. The original description and illustration of this species show the petals in two series, but this crucial part of the original diagnosis was based on a single flower, admitted by Hooker to be a poor specimen, which no longer exists.

Clathrospermum was included in *Popowia* Endl. by Engler et Diels (Monogr. Afr. Annonac. 43 (1901)). When various species of *Popowia* were subsequently transferred into the new genus *Enneastemon,* the much earlier genus *Clathrospermum* was, presumably, dismissed because the original description stated (incorrectly as we now know) that the petals were in two series.

Enneastemon is therefore proposed for conservation against *Clathrospermum* in view of the facts that (1) *Clathrospermum* was incorrectly diagnosed on the basis of a single flower which no longer exists, (2) *Clathrospermum* has not been used for more than 50 years, (3) *Enneastemon* has been universally adopted in recent works including three Floras, and (4) to avoid at least 9 specific transfers.

Proposed by: R. W. J. Keay (Kew) and R. Boutique (Brussels).

Resolutions adopted by the London Horticultural Congress

transmitted to

The Paris Botanical Congress

The International Committee on Horticultural Nomenclature and Registration of the Thirteenth International Horticultural Congress, London 1952 published the following report (Gardeners' Chronicle III. 133: 27. Jan. 1953) on the promotion of stability in the botanical names of cultivated plants.

The Committee has considered carefully the very important question of the avoidance of changes in the botanical names of widely cultivated plants. The Committee, while fully appreciating that, from time to time, name-changes due to revision of classification are inevitable if continued progress in taxonomic botany is to be made, is strongly of the opinion that, in the general interest of all users of botanical names, changes due solely to the discovery of earlier names should be reduced to a minimum.

The Committee has agreed unanimously that, while there were cogent objections to the principle of *Nomina Specifica Conservanda,* it is strongly in favour of the proposal for the introduction of *Nomina Specifica Rejicienda* put forward by the British members of the "Stockholm Committee" for Urgent Nomenclatural Needs and published in Taxon I no. 5 (1952). Very briefly, this proposal, in so far as it particularly affects cultivated plants, provides for the rejection of earlier synonyms that would otherwise lead to namechanges in widely cultivated plants.

The Committee is confident that the incorporation of this proposal in the International Botanical Code would be of great benefit to users of plant names and hopes that the Congress will strongly support its adoption by the next Botanical Congress. At the same time, the Committee notes that there is no provision in this proposal for the rejection of earlier homonyms, the discovery of which would, as in the case of earlier synonyms, necessitate changes in well-known names. The Committee fully realizes that there are technical difficulties in inserting such a provision, but it strongly urges that an attempt be made by competent botanical authorities to frame a suitable proposal acceptable to the next *International Botanical Congress.*

The Committee accordingly put forward the following two Resolutions for adoption by the Congress and transmission to the next International Botanical Congress:

Resolution III. The Thirteenth International Horticultural Congress is strongly of the opinion that the interest of increased stability in the nomenclature of cultivated plants

would be served by the incorporation into the International Code of Botanical Nomenclature of the proposals for *Nomina Specifica Rejicienda* set out in Taxon I no. 5 (1952), and urges their adoption at the next International Botanical Congress.

Resolution IV. The Thirteenth International Horticultural Congress is strongly of the opinion that any provision for *Nomina Specifica Rejicienda* should allow for the rejection of certain earlier homonyms, as well as earlier synonyms, and, while appreciating the technical difficulties involved, urges the appropriate botanical authorities to make every effort to overcome them.

NEW BOOKS ON POLLEN ANALYSIS

E. M. van Zinderen Bakker, South African Pollen Grains and Spores, Part I, Amsterdam/Cape Town, 1953, 88 pp.

Lucy M. Cranwell, New Zealand Pollen Studies, The Monocotyledons, Bull. of the Auckland Inst. and Mus. No. 3, 1953, 91 pp.

Fr. Jonas, Atlas zur Bestimmung rezenter und fossiler Pollen und Sporen, Feddes Repertorium, Beiheft 133, 1952, 60 pp.

Palynology nowadays meets with interest in different parts of the world, and in several countries accounts have already appeared or are in preparation. In Europe and North America this branch of botanical science has advanced to a great extent, and here a network of pollen diagrams covering holocene and older deposits has already been published. In other countries the preparatory work, viz. the study of the pollen grains and spores of the recent native flora after the model set by Selling's splendid studies of the vegetation of Hawaii, is in progress.

Dr van Zinderen Bakker of the University of Orange Free State, Bloemfontein, South Africa, found peat deposits in various parts of the country and succeeded in isolating pollen grains and spores from them. However, only after the morphology of the recent South African pollen grains has been investigated, results can be achieved in palynological peat investigation. For this reason the author started a slide collection of pollen and spore samples; choosing for this purpose important genera and species of South African plants, and after this collection of pollen and spores an atlas is being prepared which will be published in sections. The first part, dealing with *Gymnospermae, Chlamydospermae, Monocotyledones* and some Dicotyledonous families, has now been published with financial aid of the South African Council for Scientific and Industrial Research. The volume contains 16 plates with alltogether 76 drawings made by the author and fully described in 52 pages text, followed by a bibliography of 2 pages, a glossary of 6 pages and an index to the latin plant names. In describing the pollen grains the author uses Erdtman's terminology with the addition of some terms lent from Wodehouse and Selling. The terminology of Iversen & Troels-Smith is not used in the descriptions, and is not mentioned in the glossary.

The complete work will be indispensable as a base for future South African peat investigation; and the publication of the first South African pollen diagrams will have to wait untill after the completion of the present work. It may also prove useful in taxonomic studies of South African genera.

In New Zealand also peat bogs occur and here too the morphology of the pollen grains and spores of the recent species has to be investigated before palynological peat studies can be started.

Lucy M. Cranwell (Mrs Watson Smith), formerly a member of the staff of the Auckland Institute and Museum, now in Cambridge (Mass.), U.S.A., has published an account on her New Zealand pollen studies, Monocotyledons. The work was issued jointly by the Harvard University Press and the Auckland Institute and Museum, and consists of a general introduction (8 pp.), a glossary of pollen terms (2 pp.) and a key to the pollen grains of the Monocotyledons which leads either to the family or to the genus or species. Then a systematically arranged descriptive part follows, provided with several text figures. This author uses the terminology of Iversen & Troels-Smith in describing the pollen grains. 8 Plates containing 115 microphotographs of pollen grains are added to the work. These photographs not only show monocotyledonous pollen grains but also, on plates 1, 2 and 8, those of several Dicotyledons and Gymnosperms in order to show different types of pollen grains

(pl. 1) and different kinds of pores (pl. 2). The meaning of the figures of Dicotyledonous grains and of spores of Pteridophytes on pl. 8 is not clear; in the opinion of the present reporter they do not fit in with the rest.

It is not said, neither in the introduction by the Director of the Auckland Institute and Museum, nor in the author's foreword, that future volumes, dealing with Pteridophytes, Gymnosperms and Dicotyledons, will appear; it is, of course, desirable and necessary that this work be continued.

As already in the course of the last 30 years some atlasses of west- and central-European pollen grains have appeared, especially in Germany, one wonders whether Fr. Jonas, who published a new atlas, is of opinion that he found new aspects. The book contains 57 plates with many drawings, made by the author, of pollen grains and spores. The sequence of the plates and figures, however, is very arbitrary, as e.g. pl. 1 figures *Polygonaceae*, pl. 2 *Rosaceae*, pl. 3, 4 & 6 *Gramineae*, pl. 5 *Gramineae* and one *Carex* species, pl. 7 *Cyperaceae*, pl. 8 *Potamogeton Sparganium, Batrachium, Elisma, Isoetes* and *Lobelia*, pl. 9 *Sagittaria, Myriophyllum, Rubus* and *Hippophae*, pl. 10, 11 & 13 pollen grains isolated from a peat bog near Rhede, pl. 12 grains from a peat bog near Aschendorf, pl. 14, 15 & 16 *Compositae*, etc. This is so much the worse as an index to the book is lacking so that it is nearly impossible to consult the figures. To plates 1—49 a short description of the figured grains or descriptions of the localities are added; the grains figured on pl. 50-57 are, for an unknown reason, without descriptions. Plates containing figures of pollen grains, more or less systematically arranged, and plates figuring a selection of pollen grains isolated from a certain peat bog investigated by the author, are mixed in a strange way. On some plates the figures are provided with the names of the species, on other plates the separate figures are numbered only. Moreover the drawings are very coarse.

In a short foreword (5 pp.) the author discusses previously published atlasses and illustrations of pollen grains. It is noteworthy that the work of Erdtman is not mentioned. Finally we may remark that this book does by no means enrich the palynological literature, and the present reporter wonders why the editor of Fedde's Repertorium found it worth publishing in this series. F. P. Jonker.

INTERNATIONAL CODE OF BOTANICAL NOMENCLATURE

Publication dates

The article by Robert Brown "On the Asclepiadeae, a natural order of plants separated from the Apocineae of Jussieu" appears on pp. 12-78 of the Memoirs of the Wernerian Natural History Society, vol. 1. The title-page of that volume bears the phrase "for the years 1808, -9, -10", and is dated 1811. *Huernia* is described on p. 22, from examination of *Stapelia campanulata, S. venusta,* and *S. guttata. Oxypetalum* is described on p. 41; "the genus consists of a single (unnamed) species, which was discovered in 1768, near Rio de Janeiro, by Sir Joseph Banks". *Ichnocarpus* is described on p. 61, from "the original specimen in Herman's herbarium" of *Apocynum frutescens* L. *Parsonsia* (not *"Parsonia"*) is described on p. 64; four described species are mentioned as members of the genus: *"Echites corymbosa* Jacq. *floribunda* Sw. and *spicata* Jacq." (Americanae), and *"Periploca capsularis,* Forst. prod. n. 126" (Australasienses). *Prestonia* is described on p. 69, for *P. tomentosa. Alstonia* is described on p. 75, for *Echites scholaris* L., *A. spectabilis,* A. *venenata,* and *Echites costata* Forst.

The question has arisen (Taxon 2: 34) whether the data of publication of these genera is 1809 or 1811. The first page of Brown's article notes "Read 4th November 1809". That of course does not indicate the date of publication, although it may be taken to suggest that the article is not likely to have been published before the end of 1809. Since the title-page reads "1811", the possibility of publication before that year apparently depends on whether or not the volume was published in separate parts. There is no indication of division in the copy at hand. Furthermore, the volume is made up of 16-page (8-leaf) signatures, of which the 1st, 3rd, 5th, and 7th pages are numbered at the foot for folding and binding — in the first signature, for example, respectively, A, A2, A3, and A4; the remaining leaves of the signature bear, as is normal, only page numbers. Comparison of the signature with the text shows that no article except the first begins on the first page of a signature, and

no article ends on the last, for the first 463 pages. Since the pages of a signature are those that are printed on a single sheet of paper, it would therefore have been impossible to make a division into parts anywhere in these 463 pages in such a way as to avoid cutting an article in two. One article does end on p. 464 (sign. Ff) and another does begin on p. 465 (sign. Gg); since there are only 158 additional pages in the volume, it seems unlikely that it would have been issued in two parts separated between pp. 464 and 465. The article that begins on p. 465 was "Read 11th Feb. 1809", nearly nine months before the Brown paper.

This is obviously not proof that the volume was *issued* as an undivided whole in 1811; but it does indicate that the volume was *printed* as a unit. In the absence of proof or probability that it ever was distributed in parts, it seems necessary to accept 1811 as the correct date.

DONALD P. ROGERS.

Cultivated plants

The definite text has been published (July 1953) of the International Code of Nomenclature for Cultivated Plants, supplementing Article 38 of the International Code of Botanical Nomenclature, as was envisaged when that article was drafted and constituting the definite text of Appendix III. The full title of this Code is:

International Code of Nomenclature for Cultivated Plants. Formulated and Adopted by The International Botanical Congress Committee for the Nomenclature of Cultivated Plants and The International Committee on Horticultural Nomenclature and Registration at the Thirteenth International Horticultural Congress, London, September 1952. Edited by William T. Stearn. 1953, London, The Royal Horticultural Society, Vincent Square, S.W. 1. Price 1/— postage 3d.

Its publication completes the task begun in 1950 at the 7th International Botanical Congress, Stockholm, where Mr WILLIAM T. STEARN undertook to correlate and fuse into a single document the various proposals for the nomenclature of cultivated plants that were due for discussion. No one among the group which then debated and argued over the provisions of that document envisaged its growth into anything quite so elaborate as the present *Code*. All realized, however, that to be effective such a code would have to be built upon a broad foundation of international agreement between horticulturists, agriculturists and foresters no less than between botanists. At every stage in its development is has accordingly been submitted to a considerable number of well-informed persons in many countries and has been made the subject of extensive discussion and correspondence. No one at Stockholm envisaged how much work and time that would involve. The main outline of its history will be found in the introduction to the *Code*. It is hoped that such a plain statement of the facts will dispel for ever any suspicion that this slowly developed und much deliberated work is the hasty improvisation of a small clique ignorant of other Codes, for nothing could be further from the truth, as all persons who have taken part in its preparation will be well aware.

The immediate task of all persons interested in promoting uniformity and stability in the names of cultivated plants is now to *give the Code the maximum publicity*. Some means of doing this are suggested in the introduction. The Royal Horticultural Society (Vincent Square, London S.W. 1) is putting the *Code* on sale, as an advance reprint from the Report of the 13th International Horticultural Congress, at the modest price of 1/— (one shilling sterling), postage extra, so the cost should be no obstacle to its wide circulation. Institutions and Societies would do well to acquire a number of copies for distribution to their members.

The publication of *translations* is also much to be desired. A German translation is already being prepared under the auspices of the Gartenbau-Nomenklatur-Ausschuss, Hannover, and Mr Stearn would like to be informed about other translations.

Interpretation of the term hysteranthous

by

R. A. DYER (Pretoria)

The term *hysteranthous* should be abandoned or suitably redefined.

Argument: The term *hysteranthous* is derived from the Greek words *hysteros* (following) *anthos* (flower). Jackson in his Glossary of Botanical Terms (Ed. 4: 1928)

states: "used of leaves which are produced after the flowers, as in the almond".

Had the term been used in botanical literature in Jacksons' restricted sense only, to shrubs or trees "such as the almond", ambiguity might not have arisen, but the term appears in descriptions of species in such families as Amaryllidaceae, Liliaceae and Iridaceae.

Even when the term is used for plants such as the almond it may be misleading, since, as is common knowledge, the flower buds are produced on old wood in the axils of leaves which fall in autumn. The leaves referred to by Jackson in defining the term *hysteranthos* are the leaves of new spring growth which will themselves later produce flowering buds in their axils. In the nature of the growth cycle in flowering plants the leaves precede the development of flowers, and it is the flowers which "follow" the leaves.

When in species of the families Amaryllidaceae, Liliaceae and Iridaceae, the flowers and leaves are not produced at the same time the plants are frequently said to be *hysteranthous*. In this alternation of leaf and flower cycle, it is the leaf cycle which is responsible for building up the food supply of the bulb and again it is the inflorescence which "follows". It so happens, however, that there is often an appreciable resting period, after the leaves die down, before the inflorescence appears, and a relatively short period before new leaves "follow" that inflorescence. But the inflorescence is obviously external to the new leaves, which in turn feed the bulb in preparation for the production of an inflorescence in the next growing season.

Examples of this nature are frequent in the flora of Southern Africa and particularly so in the south western area with a predominantly winter rainfall. (See *Brunsvigia, Haemanthus, Urginea, Drimia,* etc.).

In some species of *Eriospermum* (Liliaceae) with tubers, the leaves and inflorescences are produced in alternating cycles and are said to be *hysteranthous*. In many species only one leaf is produced from a growing "eye" in a season and after a resting period, the inflorescence which follows grows up through the centre of the old petiole. If another tuber in the same area, or another "eye" on the same tuber, fails to flower, their new leaves are often produced at the same time as the inflorescences of flowering tubers. Here again the term *hysteranthous* is not applicable.

In the winter rainfall area of the Cape Province some *Iridaceae*, including several species of *Gladiolus*, produce vegetative leaves and inflorescences at different seasons. They too have been termed *hysteranthous*. In their case the leaf which "follows" the inflorescence does not arise from the same growing point as the inflorescence but from a lateral bud. The new leaf is destined to feed and build up an entirely new corm which enters a resting period preparatory to the production of an inflorescence and another new leaf and new corm in the next growing season.

For these reasons it is proposed that the term *hysteranthous* should be abandoned or suitable re-defined to avoid ambiguity. *

* Memoir presented to the section of Botanical Terminology of the Paris Congress.

CHINESE FLORA PROJECT

The text has been published of an essay by Shiu-ying Hu on the problem of the preparation of a Flora of China. In this essay a project is outlined to solve this problem. An understanding on this project was effected between the Arnold Arboretum of Harvard University and the China International Foundation. Dr Shiu-ying Hu will be in direct charge of the Project under the general supervision of Dr J. M. Johnston and with the overall guidance of Dr E. D. Merrill.

LIVERPOOL CITY MUSEUMS

The Indian collections of John Forbes Royle were recently discovered in the Liverpool herbarium after having been lost for over a hundred years. John Forbes Royle (Cawnpore, 1800 — Acton near London, 1858) was the author of "Illustrations of the Botany and other branches of the natural history of the Himalayan Mountains and of the Flora of Cashmere", London, Allen et Co., 1839 (2 vols, folio) and of several publications on materia medica and useful plants of India. Other sets of Indian plants collected by Royle are preserved in the Kew, Cambridge and Dehra Dun herbaria.

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TAXON

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